



FCC RF Test Report

APPLICANT : SAMSUNG ELECTRONICS CO., LTD.
EQUIPMENT : Mobile phone
BRAND NAME : SAMSUNG
MODEL NAME : SM-A7009
FCC ID : A3LSMA7009
STANDARD : FCC Part 15 Subpart E §15.407
CLASSIFICATION : (NII) Unlicensed National Information Infrastructure

The product was received on Nov. 11, 2014 and testing was completed on Nov. 26, 2014. We, SPORTON INTERNATIONAL (SHENZHEN) 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 (SHENZHEN) INC., the test report shall not be reproduced except in full.

Reviewed by: Joseph Lin / Supervisor

Approved by: Jones Tsai / Manager



SPORTON INTERNATIONAL (SHENZHEN) INC.

**1F & 2F, Building A, Morning Business Center, No. 4003 ShiGu Rd., Xili Town,
Nanshan District, Shenzhen, Guangdong, P. R. China**



TABLE OF CONTENTS

REVISION HISTORY	3
SUMMARY OF TEST RESULT	4
1 GENERAL DESCRIPTION	5
1.1 Applicant	5
1.2 Manufacturer	5
1.3 Feature of Equipment Under Test	5
1.4 Product Specification of Equipment Under Test	6
1.5 Modification of EUT	7
1.6 Testing Location	7
1.7 Applicable Standards	7
2 TEST CONFIGURATION OF EQUIPMENT UNDER TEST	8
2.1 Carrier Frequency Channel	9
2.2 Pre-Scanned RF Power	10
2.3 Test Mode	12
2.4 Connection Diagram of Test System	14
2.5 Support Unit used in test configuration and system	15
2.6 EUT Operation Test Setup	15
2.7 Measurement Results Explanation Example	15
3 TEST RESULT	16
3.1 26dB & 99% Occupied Bandwidth Measurement	16
3.2 Maximum Conducted Output Power Measurement	19
3.3 Power Spectral Density Measurement	23
3.4 Unwanted Radiated Emission Measurement	27
3.5 AC Conducted Emission Measurement	70
3.6 Frequency Stability Measurement	74
3.7 Automatically Discontinue Transmission	76
3.8 Antenna Requirements	77
4 LIST OF MEASURING EQUIPMENTS	78
5 UNCERTAINTY OF EVALUATION	79



REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR4N1105F	Rev. 01	Initial issue of report	Dec. 04, 2014



SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	2.1049 15.403(i)	26dB & 99% Bandwidth	-	Pass	-
3.2	15.407(a)	Maximum Conducted Output Power	≤ 24 dBm	Pass	-
3.3	15.407(a)	Power Spectral Density	≤ 11 dBm	Pass	-
3.4	15.407(b)	Unwanted Emissions	$\leq -17, -27$ dBm (depend on band)&15.209(a)	Pass	Under limit 4.23 dB at 54.250 MHz
3.5	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 18.64 dB at 0.620 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

SAMSUNG ELECTRONICS CO., LTD.

416 Maetan-3dong, Yeongtong-gu, Suwon-City, Gyeonggi-do, 443-742, Korea

1.2 Manufacturer

SAMSUNG ELECTRONICS CO., LTD.

416 Maetan-3dong, Yeongtong-gu, Suwon-City, Gyeonggi-do, 443-742, Korea

1.3 Feature of Equipment Under Test

Product Feature	
Equipment	Mobile phone
Brand Name	SAMSUNG
Model Name	SM-A7009
FCC ID	A3LSMA7009
GSM Operating Band(s)	GSM 900/1800/1900MHz
GPRS/EGPRS Multislot Class	GPRS Class 10, EGPRS Class 10
WCDMA Operating Band(s)	FDD Band I / II / V
LTE Operating Band(s)	FDD Band 1/3 TDD Band 41
Wi-Fi Specification	2.4GHz 802.11b/g/n HT20 5GHz 802.11a/n HT20/HT40
Bluetooth Version	Bluetooth v3.0 + EDR/Bluetooth v4.0 LE
NFC Specification	Type A/B/F
ANT+ Specification	2.4GHz
HW Version	REV0.5
SW Version	A7009.05
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 ~ 5700 MHz
Maximum Output Power to Antenna	<5180 MHz ~ 5240 MHz> 802.11a : 8.66 dBm / 0.0073 W 802.11n HT20 : 7.96 dBm / 0.0063 W 802.11n HT40 : 7.39 dBm / 0.0055 W <5260 MHz ~ 5320 MHz> 802.11a : 9.35 dBm / 0.0086 W 802.11n HT20 : 8.61 dBm / 0.0073 W 802.11n HT40 : 8.29 dBm / 0.0067 W <5500 MHz ~ 5700 MHz> 802.11a : 9.51 dBm / 0.0089 W 802.11n HT20 : 8.73 dBm / 0.0075 W 802.11n HT40 : 8.65 dBm / 0.0073 W
Antenna Type	FPCB Antenna
Antenna Gain	<5180 MHz ~ 5240 MHz> : -3.80 dBi <5260 MHz ~ 5320 MHz> : -3.20 dBi <5500 MHz ~ 5700 MHz> : -3.90 dBi
Type of Modulation	802.11a/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

Test Site	SPORTON INTERNATIONAL (SHENZHEN) INC.	
Test Site Location	1F & 2F, Building A, Morning Business Center, No. 4003 ShiGu Rd., Xili Town, Nanshan District, Shenzhen, Guangdong, P. R. China TEL: +86-755-8637-9589 FAX: +86-755-8637-9595	
Test Site No.	Sporton Site No.	
	TH01-SZ	CO01-SZ

Test Site	SPORTON INTERNATIONAL (SHENZHEN) INC.	
Test Site Location	No. 3 Building, the third floor of south, Shahe River west, Fengzeyuan warehouse, Nanshan District, Shenzhen, Guangdong, P. R. China TEL: +86-755- 3320-2398	
Test Site No.	Sporton Site No.	FCC Registration No.
	03CH01-SZ	831040

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 E
- ♦ FCC KDB 789033 D02 General UNII Test Procedures New Rules v01
- ♦ 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) 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)
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		

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

2.2 Pre-Scanned RF Power

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

5GHz 802.11a RF Output Power (dBm)										
Power vs. Channel			Power vs. MCS Index							
Channel	Frequency (MHz)	MCS Index 6Mbps	Channel	9M bps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
CH 36	5180	8.04	CH 48	8.48	8.56	8.32	8.52	8.59	8.46	8.47
CH 44	5220	8.21								
CH 48	5240	8.66								
CH 52	5260	8.79	CH 64	9.21	9.23	9.08	9.19	9.27	9.22	9.24
CH 60	5300	9.16								
CH 64	5320	9.35								
CH 100	5500	7.94	CH 140	9.40	9.33	9.16	9.38	9.36	9.35	9.34
CH 116	5580	8.91								
CH 140	5700	9.51								

5GHz 802.11n HT20 RF Output Power (dBm)										
Power vs. Channel			Power vs. MCS Index							
Channel	Frequency (MHz)	MCS Index MCS0	Channel	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 36	5180	7.34	CH 48	7.76	7.78	7.84	7.81	7.77	7.86	7.80
CH 44	5220	7.51								
CH 48	5240	7.96								
CH 52	5260	8.09	CH 64	8.48	8.48	8.49	8.51	8.53	8.52	8.52
CH 60	5300	8.46								
CH 64	5320	8.61								
CH 100	5500	7.24	CH 140	8.55	8.60	8.63	8.66	8.66	8.67	8.63
CH 116	5580	8.21								
CH 140	5700	8.73								

5GHz 802.11n HT40 RF Output Power (dBm)										
Power vs. Channel			Power vs. MCS Index							
Channel	Frequency (MHz)	MCS Index MCS0	Channel	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 38	5190	7.39	CH 38	7.24	7.28	7.11	7.16	7.21	7.17	7.21
CH 46	5230	7.36								
CH 54	5270	8.05	CH 62	8.12	8.14	7.92	8.03	8.06	8.01	8.07
CH 62	5310	8.29								
CH 102	5510	6.91	CH 134	8.45	8.52	8.31	8.38	8.44	8.34	8.42
CH 110	5550	7.50								
CH 134	5670	8.65								

2.3 Test Mode

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

Test Cases				
Conducted TCs	Test Items	Mode	Data rate	Test Channel
	26dB and 99% 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
	Frequency Stability	802.11a	6 Mbps	L/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
AC Conducted Emission	Mode 1 : GSM1900 Idle + Bluetooth Link + WLAN 5GHz Link + USB Cable (Charging from Adapter) + Earphone			
Remark: For radiated test cases, the tests were performed with adapter, earphone and USB cable.				



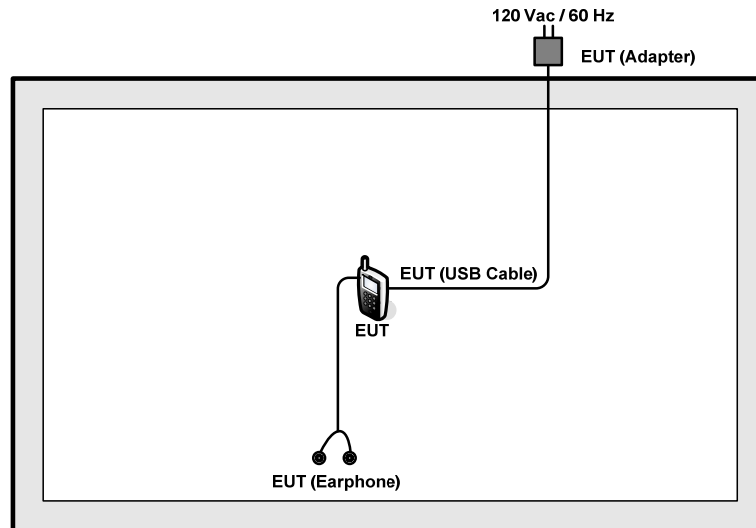
Ch. #		Band I : 5150-5250 MHz	Band II : 5250-5350 MHz	Band III : 5470-5600 MHz and 5650-5725MHz
		802.11a	802.11a	802.11a
L	Low	36	52	100
M	Middle	44	60	116
H	High	48	64	140

Ch. #		Band I : 5150-5250 MHz	Band II : 5250-5350 MHz	Band III : 5470-5600 MHz and 5650-5725MHz
		802.11n HT20	802.11n HT20	802.11n HT20
L	Low	36	52	100
M	Middle	44	60	116
H	High	48	64	140

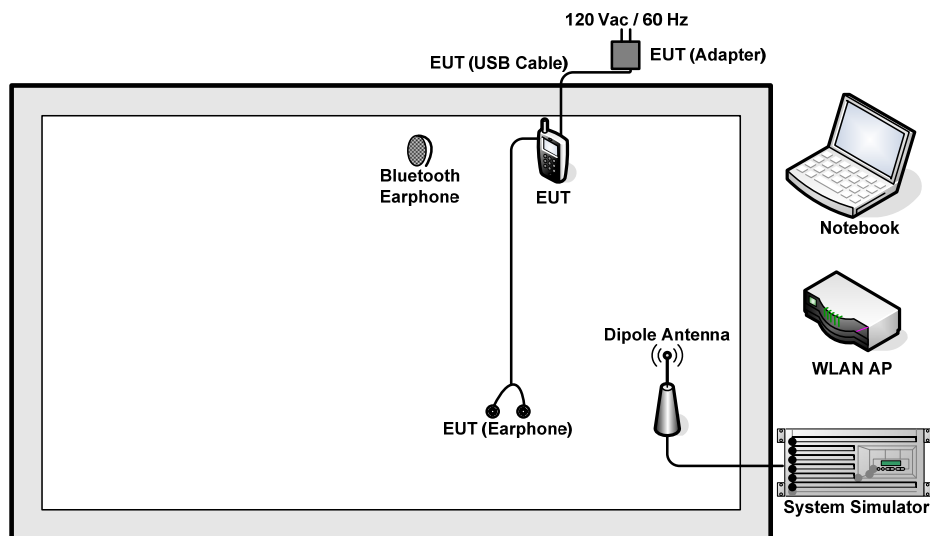
Ch. #		Band I : 5150-5250 MHz	Band II : 5250-5350 MHz	Band III : 5470-5600 MHz and 5650-5725MHz
		802.11n HT40	802.11n HT40	802.11n HT40
L	Low	38	54	102
M	Middle	-	-	110
H	High	46	62	134

2.4 Connection Diagram of Test System

<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.	System Simulator	R&S	CMW 500	N/A	N/A	Unshielded, 1.8 m
2.	WLAN AP	D-Link	DIR-815	KA2IR815A1	N/A	Unshielded, 1.8 m
3.	Notebook	Lenovo	G480	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
4.	Bluetooth Earphone	Nokia	BH-108	PYAHS-107W	N/A	N/A

2.6 EUT Operation Test Setup

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

For AC power line conducted emissions, the EUT was set to connect with the WLAN AP under large package sizes transmission.

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 5.5 dB and 10dB attenuator.

$$\begin{aligned}
 \text{Offset(dB)} &= \text{RF cable loss(dB)} + \text{attenuator factor(dB)}. \\
 &= 5.5 + 10 = 15.5 \text{ (dB)}
 \end{aligned}$$

3 Test Result

3.1 26dB & 99% Occupied Bandwidth Measurement

3.1.1 Description of 26dB & 99% Occupied Bandwidth

This section is for reporting purpose only.

There is no restriction limits for bandwidth.

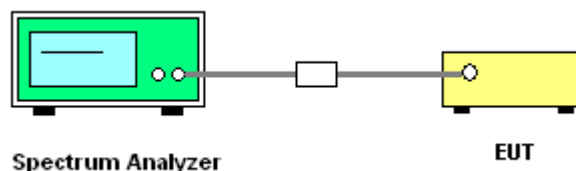
3.1.2 Measuring Instruments

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 D02 General UNII Test Procedures New Rules v01.
Section C) 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. For 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) is set 1MHz and set the Video bandwidth (VBW) $\geq 3 * \text{RBW}$.
8. Measure and record the results in the test report.

3.1.4 Test Setup





3.1.5 Test Result of 26dB & 99% Occupied Bandwidth Plots

Test Band :	5GHz band 1	Temperature :	24~26℃
Test Engineer :	Mygai Mo	Relative Humidity :	50~53%

Mod.	Data Rate	N _{TX}	Channel	Freq. (MHz)	99% Bandwidth (MHz)	99% Bandwidth EIRP Limit (dBm)
11a	6Mbps	1	36	5180	18.25	22.61
11a	6Mbps	1	44	5220	18.30	22.62
11a	6Mbps	1	48	5240	18.25	22.61
HT20	MCS0	1	36	5180	19.10	22.81
HT20	MCS0	1	44	5220	19.05	22.80
HT20	MCS0	1	48	5240	19.00	22.79
HT40	MCS0	1	38	5190	36.60	23.01
HT40	MCS0	1	46	5230	36.60	23.01

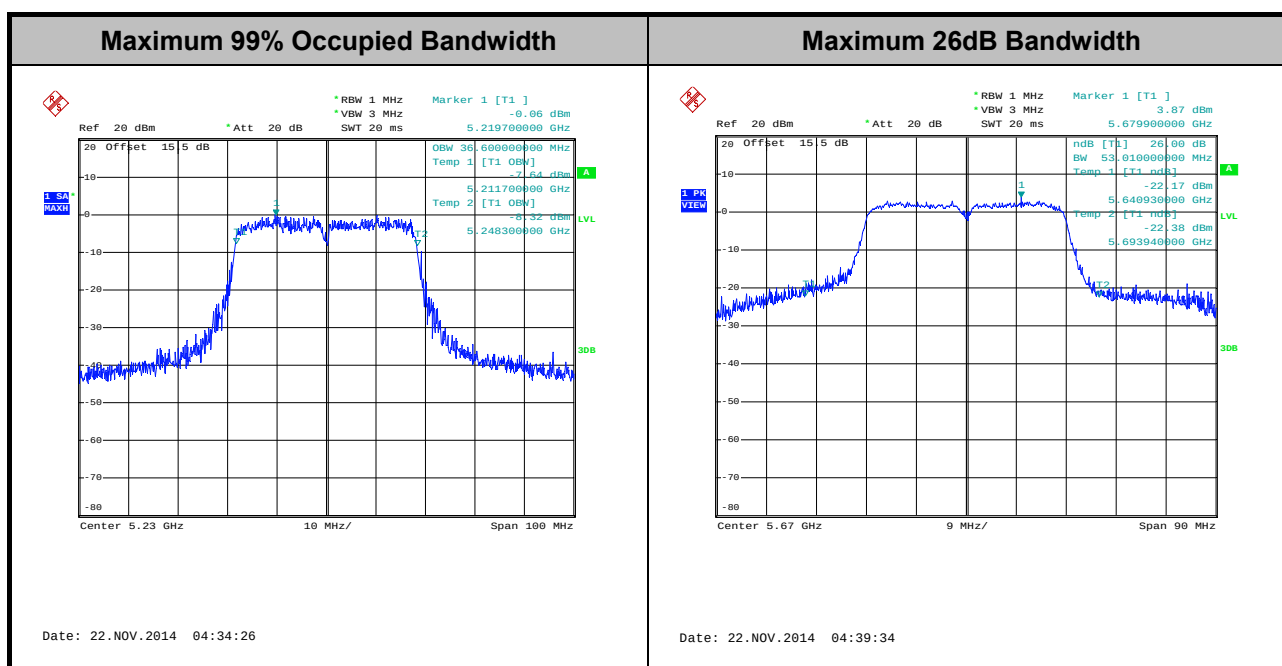
Test Band :	5GHz band 2	Temperature :	24~26℃
Test Engineer :	Mygai Mo	Relative Humidity :	50~53%

Mod.	Data Rate	N _{TX}	Channel	Freq. (MHz)	26dB Bandwidth (MHz)	FCC 26dB Bandwidth Power Limit (dBm)
11a	6Mbps	1	52	5260	24.05	23.98
11a	6Mbps	1	60	5300	24.30	23.98
11a	6Mbps	1	64	5320	25.00	23.98
HT20	MCS0	1	52	5260	24.20	23.98
HT20	MCS0	1	60	5300	24.20	23.98
HT20	MCS0	1	64	5320	25.65	23.98
HT40	MCS0	1	54	5270	45.27	23.98
HT40	MCS0	1	62	5310	45.63	23.98



Test Band :	5GHz band 3	Temperature :	24~26°C
Test Engineer :	Mygai Mo	Relative Humidity :	50~53%

Mod.	Data Rate	N _{TX}	Channel	Freq. (MHz)	26dB Bandwidth (MHz)	FCC 26dB Bandwidth Power Limit (dBm)
11a	6Mbps	1	100	5500	24.45	23.98
11a	6Mbps	1	116	5580	29.45	23.98
11a	6Mbps	1	140	5700	39.65	23.98
HT20	MCS0	1	100	5500	24.50	23.98
HT20	MCS0	1	116	5580	29.45	23.98
HT20	MCS0	1	140	5700	33.30	23.98
HT40	MCS0	1	102	5510	45.99	23.98
HT40	MCS0	1	110	5550	45.54	23.98
HT40	MCS0	1	134	5670	53.01	23.98



Note: The occupied channel bandwidth is maintained within the band of operation for all of the modulations.

3.2 Maximum Conducted Output Power Measurement

3.2.1 Limit of Maximum Conducted Output Power

<FCC 14-30 CFR 15.407>

For mobile and portable client devices in the 5.15–5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW.

For the 5.25–5.35 GHz and 5.47–5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz.

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.

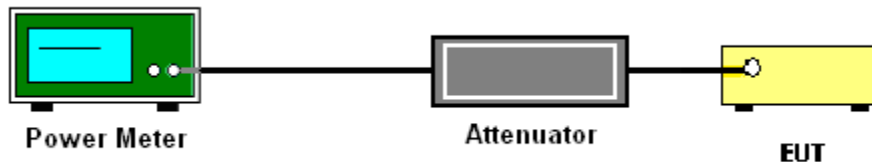
3.2.3 Test Procedures

The testing follows Method PM of FCC KDB 789033 D02 General UNII Test Procedures New Rules v01.

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 :	24~26℃
Test Engineer :	Mygai Mo	Relative Humidity :	50~53%

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	0.32	8.04	23.98	-3.80	Pass
11a	6Mbps	1	44	5220	0.32	8.21	23.98	-3.80	Pass
11a	6Mbps	1	48	5240	0.32	8.66	23.98	-3.80	Pass
HT20	MCS0	1	36	5180	0.32	7.34	23.98	-3.80	Pass
HT20	MCS0	1	44	5220	0.32	7.51	23.98	-3.80	Pass
HT20	MCS0	1	48	5240	0.32	7.96	23.98	-3.80	Pass
HT40	MCS0	1	38	5190	0.68	7.39	23.98	-3.80	Pass
HT40	MCS0	1	46	5230	0.68	7.36	23.98	-3.80	Pass

Note: Final Output Power equals to Measured Output Power adds the duty factor.

Test Band :	5GHz band 2	Temperature :	24~26℃
Test Engineer :	Mygai Mo	Relative Humidity :	50~53%

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	0.32	8.79	23.98	-3.20	Pass
11a	6Mbps	1	60	5300	0.32	9.16	23.98	-3.20	Pass
11a	6Mbps	1	64	5320	0.32	9.35	23.98	-3.20	Pass
HT20	MCS0	1	52	5260	0.32	8.09	23.98	-3.20	Pass
HT20	MCS0	1	60	5300	0.32	8.46	23.98	-3.20	Pass
HT20	MCS0	1	64	5320	0.32	8.61	23.98	-3.20	Pass
HT40	MCS0	1	54	5270	0.68	8.05	23.98	-3.20	Pass
HT40	MCS0	1	62	5310	0.68	8.29	23.98	-3.20	Pass

Note: Final Output Power equals to Measured Output Power adds the duty factor.



Test Band :	5GHz band 3	Temperature :	24~26℃
Test Engineer :	Mygai Mo	Relative Humidity :	50~53%

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	0.32	7.94	23.98	-3.90	Pass
11a	6Mbps	1	116	5580	0.32	8.91	23.98	-3.90	Pass
11a	6Mbps	1	140	5700	0.32	9.51	23.98	-3.90	Pass
HT20	MCS0	1	100	5500	0.32	7.24	23.98	-3.90	Pass
HT20	MCS0	1	116	5580	0.32	8.21	23.98	-3.90	Pass
HT20	MCS0	1	140	5700	0.32	8.73	23.98	-3.90	Pass
HT40	MCS0	1	102	5510	0.68	6.91	23.98	-3.90	Pass
HT40	MCS0	1	110	5550	0.68	7.50	23.98	-3.90	Pass
HT40	MCS0	1	134	5670	0.68	8.65	23.98	-3.90	Pass

Note: Final Output Power equals to Measured Output Power adds the duty factor.



3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

<FCC 14-30 CFR 15.407>

For mobile and portable client devices in the 5.15–5.25 GHz band, the maximum power spectral density shall not exceed 11dBm in any 1 megahertz band.

For the 5.25–5.35 GHz and 5.47–5.725 GHz bands, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.

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.

3.3.2 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 D02 General UNII Test Procedures New Rules v01.

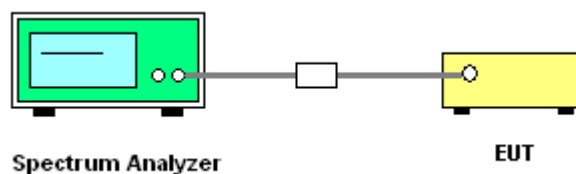
Section F) Maximum power spectral density.

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 D02 General UNII Test Procedures New Rules v01.
 - 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 :	24~26°C
Test Engineer :	Mygai Mo	Relative Humidity :	50~53%

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	0.32	-4.28	11.00	-3.80	Pass
11a	6Mbps	1	44	5220	0.32	-4.05	11.00	-3.80	Pass
11a	6Mbps	1	48	5240	0.32	-3.82	11.00	-3.80	Pass
HT20	MCS0	1	36	5180	0.32	-5.44	11.00	-3.80	Pass
HT20	MCS0	1	44	5220	0.32	-5.21	11.00	-3.80	Pass
HT20	MCS0	1	48	5240	0.32	-5.19	11.00	-3.80	Pass
HT40	MCS0	1	38	5190	0.68	-8.03	11.00	-3.80	Pass
HT40	MCS0	1	46	5230	0.68	-7.78	11.00	-3.80	Pass

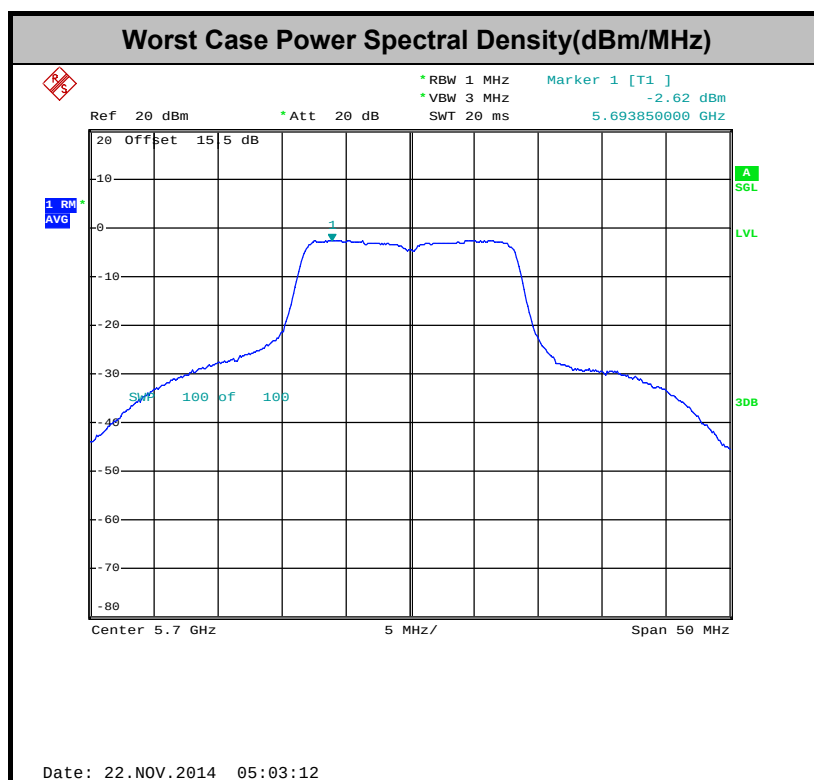
Test Band :	5GHz band 2	Temperature :	24~26°C
Test Engineer :	Mygai Mo	Relative Humidity :	50~53%

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	52	5260	0.32	-3.67	11.00	-3.20	Pass
11a	6Mbps	1	60	5300	0.32	-3.28	11.00	-3.20	Pass
11a	6Mbps	1	64	5320	0.32	-2.96	11.00	-3.20	Pass
HT20	MCS0	1	52	5260	0.32	-4.99	11.00	-3.20	Pass
HT20	MCS0	1	60	5300	0.32	-4.47	11.00	-3.20	Pass
HT20	MCS0	1	64	5320	0.32	-4.24	11.00	-3.20	Pass
HT40	MCS0	1	54	5270	0.68	-7.46	11.00	-3.20	Pass
HT40	MCS0	1	62	5310	0.68	-7.09	11.00	-3.20	Pass



Test Band :	5GHz band 3	Temperature :	24~26°C
Test Engineer :	Mygai Mo	Relative Humidity :	50~53%

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	100	5500	0.32	-4.08	11.00	-3.90	Pass
11a	6Mbps	1	116	5580	0.32	-2.54	11.00	-3.90	Pass
11a	6Mbps	1	140	5700	0.32	-2.30	11.00	-3.90	Pass
HT20	MCS0	1	100	5500	0.32	-5.23	11.00	-3.90	Pass
HT20	MCS0	1	116	5580	0.32	-3.86	11.00	-3.90	Pass
HT20	MCS0	1	140	5700	0.32	-3.23	11.00	-3.90	Pass
HT40	MCS0	1	102	5510	0.68	-7.85	11.00	-3.90	Pass
HT40	MCS0	1	110	5550	0.68	-7.22	11.00	-3.90	Pass
HT40	MCS0	1	134	5670	0.68	-6.09	11.00	-3.90	Pass



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

3.4 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 Part 15.205.

3.4.1 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 Part 15.205 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.

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



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

- (3) KDB789033 v01 G)2)c) 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.

3.4.2 Measuring Instruments

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

3.4.3 Test Procedures

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v01.

Section G) 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

- RBW = 1 MHz
- VBW $\geq$ 3 MHz
- Detector = Peak
- Sweep time = auto
- Trace mode = max hold

(3) Procedures for Average Unwanted Emissions Measurements Above 1000MHz

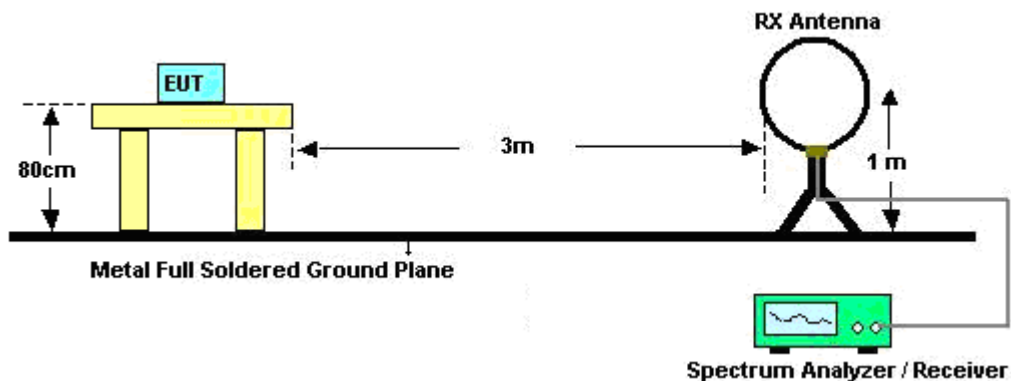
- RBW = 1 MHz
- VBW = 10 Hz, when duty cycle is no less than 98 percent.
- VBW $\geq$ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

Band	Duty Cycle(%)	T(ms)	1/T(kHz)	VBW Setting
802.11a	92.92	1.39	0.72	1kHz
802.11n HT20	92.88	1.30	0.77	1kHz
802.11n HT40	85.48	0.64	1.57	3kHz

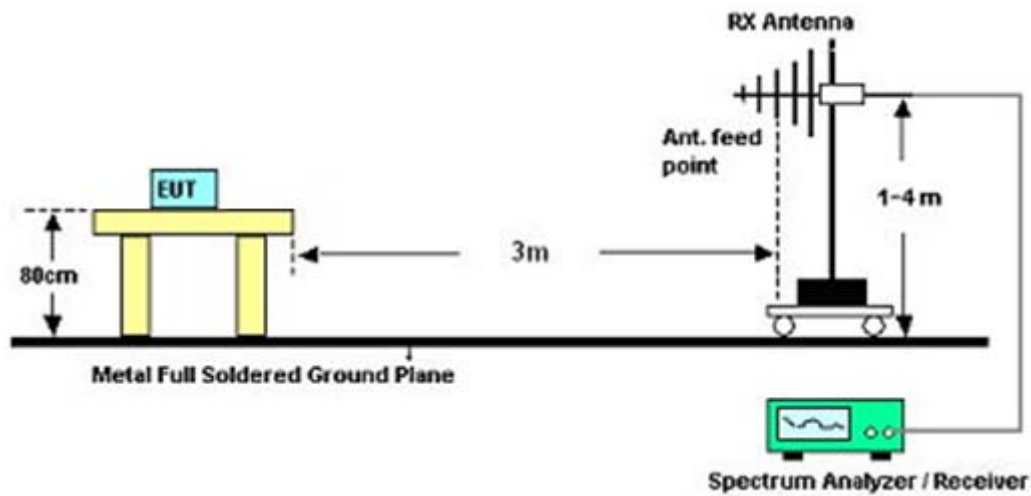
2. The EUT was placed on a rotatable table top 0.8 meter above ground.
3. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
4. The antenna is a broadband antenna and its height is adjusted between one meter and four meters 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.

3.4.4 Test Setup

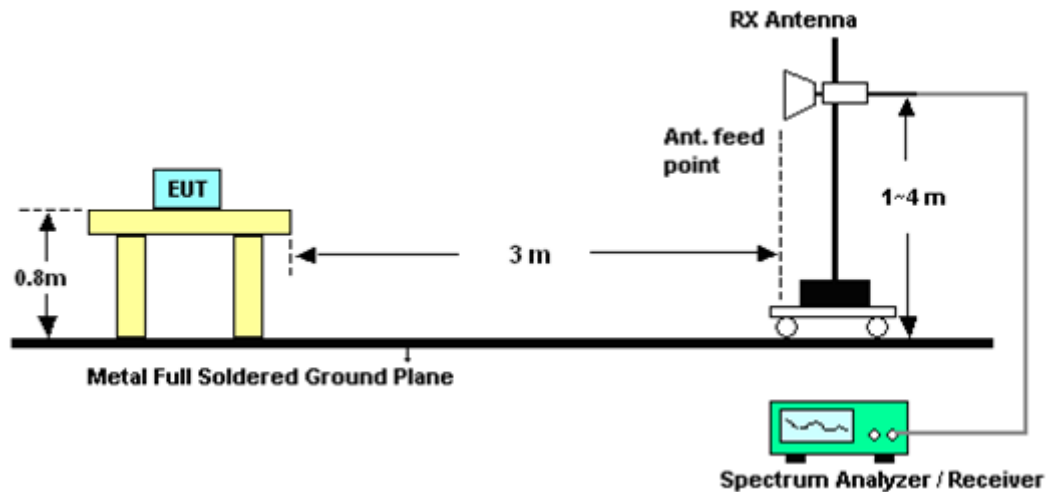
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



3.4.5 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.



3.4.6 Test Result

3.4.6.1 Test Result of Radiated Band Edges

Test Mode :	802.11a	Temperature :	23~25°C
Test Channel :	36	Relative Humidity :	50~53%
Test Engineer :	Leo Liao		

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
5052.65	54.36	-19.64	74	43.43	31.64	15.14	35.85	100	50	Peak
5149.85	41.1	-12.9	54	29.98	31.72	15.21	35.81	100	50	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
5034.65	53.14	-20.86	74	42.25	31.63	15.12	35.86	102	182	Peak
5043.95	40.96	-13.04	54	30.03	31.64	15.14	35.85	102	182	Average

Test Mode :	802.11a	Temperature :	23~25°C
Test Channel :	48	Relative Humidity :	50~53%
Test Engineer :	Leo Liao		

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
5438.55	54.24	-19.76	74	42.59	31.95	15.41	35.71	100	358	Peak
5352.31	41.28	-12.72	54	29.79	31.88	15.35	35.74	100	358	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
5447.57	53.71	-20.29	74	42.05	31.96	15.41	35.71	105	181	Peak
5457.91	41.21	-12.79	54	29.53	31.96	15.42	35.7	105	181	Average

Note:

1. Frequency range of Radiated Band Edge is from 4500-5150 MHz and 5350-5460 MHz.
2. Above only list the worst result in these frequency ranges.



Test Mode :	802.11a	Temperature :	23~25°C
Test Channel :	52	Relative Humidity :	50~53%
Test Engineer :	Leo Liao		

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
5116.1	53.2	-20.8	74	42.17	31.69	15.17	35.83	100	1	Peak
5037.95	41.01	-12.99	54	30.11	31.64	15.12	35.86	100	1	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
5005.25	52.93	-21.07	74	42.09	31.61	15.1	35.87	103	180	Peak
5019.5	40.95	-13.05	54	30.08	31.61	15.12	35.86	103	180	Average

Test Mode :	802.11a	Temperature :	23~25°C
Test Channel :	64	Relative Humidity :	50~53%
Test Engineer :	Leo Liao		

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
5350.66	57.49	-16.51	74	46	31.88	15.35	35.74	100	359	Peak
5350.22	42.61	-11.39	54	31.12	31.88	15.35	35.74	100	359	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
5449.88	55.26	-18.74	74	43.58	31.96	15.42	35.7	101	176	Peak
5350	42.5	-11.5	54	31.01	31.88	15.35	35.74	101	176	Average

Note:

1. Frequency range of Radiated Band Edge is from 4500-5150 MHz and 5350-5460 MHz.
2. Above only list the worst result in these frequency ranges.



Test Mode :	802.11a	Temperature :	23~25°C
Test Channel :	100	Relative Humidity :	50~53%
Test Engineer :	Leo Liao		

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
5464.88	59.16	-14.84	74	47.47	31.97	15.42	35.7	104	0	Peak
5469.36	42.84	-11.16	54	31.15	31.97	15.42	35.7	104	0	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
5464.08	57.73	-16.27	74	46.04	31.97	15.42	35.7	116	181	Peak
5469.36	42.41	-11.59	54	30.72	31.97	15.42	35.7	116	181	Average

Test Mode :	802.11a	Temperature :	23~25°C
Test Channel :	140	Relative Humidity :	50~53%
Test Engineer :	Leo Liao		

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
5726.44	65.38	-8.62	74	53.02	32.36	15.6	35.6	100	360	Peak
5725	48.28	-5.72	54	35.92	32.36	15.6	35.6	100	360	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
5727.8	61.16	-12.84	74	48.8	32.36	15.6	35.6	102	186	Peak
5725.08	45.82	-8.18	54	33.46	32.36	15.6	35.6	102	186	Average

Note:

1. Frequency range of Radiated Band Edge is from 5350-5470 MHz and 5725-5765 MHz.
2. Above only list the worst result in these frequency ranges.



Test Mode :	802.11n HT20	Temperature :	23~25°C
Test Channel :	36	Relative Humidity :	50~53%
Test Engineer :	Leo Liao		

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
5075.3	54.18	-19.82	74	43.2	31.67	15.15	35.84	100	57	Peak
5149.85	42.06	-11.94	54	30.94	31.72	15.21	35.81	100	57	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
5029.25	53.98	-20.02	74	43.09	31.63	15.12	35.86	115	178	Peak
5007.2	41.44	-12.56	54	30.6	31.61	15.1	35.87	115	178	Average

Test Mode :	802.11n HT20	Temperature :	23~25°C
Test Channel :	48	Relative Humidity :	50~53%
Test Engineer :	Leo Liao		

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
5449.22	53.43	-20.57	74	41.77	31.96	15.41	35.71	100	55	Peak
5356.38	41.43	-12.57	54	29.94	31.88	15.35	35.74	100	55	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
5445.92	54.07	-19.93	74	42.41	31.96	15.41	35.71	112	184	Peak
5427.88	41.37	-12.63	54	29.74	31.93	15.41	35.71	112	184	Average

Note:

1. Frequency range of Radiated Band Edge is from 4500-5150 MHz and 5350-5460 MHz.
2. Above only list the worst result in these frequency ranges.



Test Mode :	802.11n HT20	Temperature :	23~25°C
Test Channel :	52	Relative Humidity :	50~53%
Test Engineer :	Leo Liao		

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
5026.85	53.95	-20.05	74	43.06	31.63	15.12	35.86	100	55	Peak
5014.4	40.97	-13.03	54	30.13	31.61	15.1	35.87	100	55	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
5056.25	53.51	-20.49	74	42.57	31.65	15.14	35.85	102	179	Peak
5005.55	41.07	-12.93	54	30.23	31.61	15.1	35.87	102	179	Average

Test Mode :	802.11n HT20	Temperature :	23~25°C
Test Channel :	64	Relative Humidity :	50~53%
Test Engineer :	Leo Liao		

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
5378.6	54.28	-19.72	74	42.73	31.91	15.37	35.73	108	53	Peak
5350.88	41.72	-12.28	54	30.23	31.88	15.35	35.74	108	53	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
5351.21	57.25	-16.75	74	45.76	31.88	15.35	35.74	110	185	Peak
5350	41.73	-12.27	54	30.24	31.88	15.35	35.74	110	185	Average

Note:

1. Frequency range of Radiated Band Edge is from 4500-5150 MHz and 5350-5460 MHz.
2. Above only list the worst result in these frequency ranges.



Test Mode :	802.11n HT20	Temperature :	23~25°C
Test Channel :	100	Relative Humidity :	50~53%
Test Engineer :	Leo Liao		

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
5467.28	54.59	-19.41	74	42.9	31.97	15.42	35.7	103	360	Peak
5465.84	41.59	-12.41	54	29.9	31.97	15.42	35.7	103	360	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
5417.2	54.07	-19.93	74	42.47	31.93	15.39	35.72	100	0	Peak
5467.12	41.15	-12.85	54	29.46	31.97	15.42	35.7	100	0	Average

Test Mode :	802.11n HT20	Temperature :	23~25°C
Test Channel :	140	Relative Humidity :	50~53%
Test Engineer :	Leo Liao		

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	62.99	-11.01	74	50.63	32.36	15.6	35.6	100	0	Peak
5725.08	47.25	-6.75	54	34.89	32.36	15.6	35.6	100	0	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
5725.48	64.98	-9.02	74	52.62	32.36	15.6	35.6	100	173	Peak
5725	45.81	-8.19	54	33.45	32.36	15.6	35.6	100	173	Average

Note:

1. Frequency range of Radiated Band Edge is from 5350-5470 MHz and 5725-5765 MHz.
2. Above only list the worst result in these frequency ranges.



Test Mode :	802.11n HT40	Temperature :	23~25°C
Test Channel :	38	Relative Humidity :	50~53%
Test Engineer :	Leo Liao		

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
5149.4	54.99	-19.01	74	43.87	31.72	15.21	35.81	100	58	Peak
5146.55	43.15	-10.85	54	32.03	31.72	15.21	35.81	100	58	Average
5350.44	53.4	-20.6	74	41.91	31.88	15.35	35.74	100	58	Peak
5449	41.64	-12.36	54	29.98	31.96	15.41	35.71	100	58	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
5036.15	54.51	-19.49	74	43.62	31.63	15.12	35.86	103	300	Peak
5033.6	42.23	-11.77	54	31.34	31.63	15.12	35.86	103	300	Average
5408.63	54.64	-19.36	74	43.05	31.92	15.39	35.72	103	300	Peak
5400.82	42.38	-11.62	54	30.79	31.92	15.39	35.72	103	300	Average

Note:

1. Frequency range of Radiated Band Edge is from 4500-5150 MHz and 5350-5460 MHz.
2. Above only list the worst result in these frequency ranges.



Test Mode :	802.11n HT40	Temperature :	23~25°C
Test Channel :	46	Relative Humidity :	50~53%
Test Engineer :	Leo Liao		

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
5039	57.46	-16.54	74	46.56	31.64	15.12	35.86	100	55	Peak
5029.1	45.84	-8.16	54	34.95	31.63	15.12	35.86	100	55	Average
5456.26	57.33	-16.67	74	45.65	31.96	15.42	35.7	100	55	Peak
5352.31	45.39	-8.61	54	33.9	31.88	15.35	35.74	100	55	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
5009.6	58.06	-15.94	74	47.22	31.61	15.1	35.87	101	188	Peak
5033.15	45.77	-8.23	54	34.88	31.63	15.12	35.86	101	188	Average
5423.7	57.22	-16.78	74	45.62	31.93	15.39	35.72	101	188	Peak
5376.29	45.38	-8.62	54	33.85	31.89	15.37	35.73	101	188	Average

Note:

1. Frequency range of Radiated Band Edge is from 4500-5150 MHz and 5350-5460 MHz.
2. Above only list the worst result in these frequency ranges.



Test Mode :	802.11n HT40	Temperature :	23~25°C
Test Channel :	54	Relative Humidity :	50~53%
Test Engineer :	Leo Liao		

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
5054	57.66	-16.34	74	46.73	31.64	15.14	35.85	100	58	Peak
5024.3	45.39	-8.61	54	34.5	31.63	15.12	35.86	100	58	Average
5394.33	57.68	-16.32	74	46.13	31.91	15.37	35.73	100	58	Peak
5358.91	44.97	-9.03	54	33.48	31.88	15.35	35.74	100	58	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
5002.25	57.62	-16.38	74	46.79	31.6	15.1	35.87	100	190	Peak
5011.85	45.25	-8.75	54	34.41	31.61	15.1	35.87	100	190	Average
5436.79	57.9	-16.1	74	46.25	31.95	15.41	35.71	100	190	Peak
5357.15	44.88	-9.12	54	33.39	31.88	15.35	35.74	100	190	Average

Note:

1. Frequency range of Radiated Band Edge is from 4500-5150 MHz and 5350-5460 MHz.
2. Above only list the worst result in these frequency ranges.



Test Mode :	802.11n HT40	Temperature :	23~25°C
Test Channel :	62	Relative Humidity :	50~53%
Test Engineer :	Leo Liao		

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
5040.35	58.47	-15.53	74	47.57	31.64	15.12	35.86	109	0	Peak
5006.3	45.27	-8.73	54	34.43	31.61	15.1	35.87	109	0	Average
5352.75	59.19	-14.81	74	47.7	31.88	15.35	35.74	109	0	Peak
5350	45.5	-8.5	54	34.01	31.88	15.35	35.74	109	0	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
5037.8	53.24	-20.76	74	42.34	31.64	15.12	35.86	102	172	Peak
5046.35	41.52	-12.48	54	30.59	31.64	15.14	35.85	102	172	Average
5426.56	53.59	-20.41	74	41.96	31.93	15.41	35.71	102	172	Peak
5351.76	41.5	-12.5	54	30.01	31.88	15.35	35.74	102	172	Average

Note:

1. Frequency range of Radiated Band Edge is from 4500-5150 MHz and 5350-5460 MHz.
2. Above only list the worst result in these frequency ranges.



Test Mode :	802.11n HT40	Temperature :	23~25°C
Test Channel :	102	Relative Humidity :	50~53%
Test Engineer :	Leo Liao		

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
5466.8	58.77	-15.23	74	47.08	31.97	15.42	35.7	103	56	Peak
5469.52	42.91	-11.09	54	31.22	31.97	15.42	35.7	103	56	Average
5740.04	55.25	-18.75	74	42.83	32.39	15.62	35.59	103	56	Peak
5752.12	43.13	-10.87	54	30.69	32.41	15.62	35.59	103	56	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
5468.24	57.52	-16.48	74	45.83	31.97	15.42	35.7	106	174	Peak
5466	42.3	-11.7	54	30.61	31.97	15.42	35.7	106	174	Average
5746.84	55.42	-18.58	74	43	32.39	15.62	35.59	106	174	Peak
5758.68	43.1	-10.9	54	30.64	32.41	15.64	35.59	106	174	Average



Test Mode :	802.11n HT40	Temperature :	23~25°C
Test Channel :	134	Relative Humidity :	50~53%
Test Engineer :	Leo Liao		

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
5362.32	57.23	-16.77	74	45.73	31.89	15.35	35.74	100	55	Peak
5360.24	45.02	-8.98	54	33.53	31.88	15.35	35.74	100	55	Average
5761.56	58.95	-15.05	74	46.49	32.41	15.64	35.59	100	55	Peak
5755.24	46.42	-7.58	54	33.98	32.41	15.62	35.59	100	55	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
5464.72	57.63	-16.37	74	45.94	31.97	15.42	35.7	103	178	Peak
5355.6	45.03	-8.97	54	33.54	31.88	15.35	35.74	103	178	Average
5751.08	58.54	-15.46	74	46.12	32.39	15.62	35.59	103	178	Peak
5754.04	46.18	-7.82	54	33.74	32.41	15.62	35.59	103	178	Average

Note:

1. Frequency range of Radiated Band Edge is from 5350-5470 MHz and 5725-5765 MHz.
2. Above only list the worst result in these frequency ranges.

3.4.6.2 Test Result of Unwanted Radiated Emission (30MHz ~ 10th Harmonic)

Test Mode :	802.11a	Temperature :	23~25°C
Test Channel :	36	Relative Humidity :	50~53%
Test Engineer :	Leo Liao	Polarization :	Horizontal
Remark :	1. 5180 MHz is fundamental signal which can be ignored. 2. 10360 MHz is not within a restricted band and satisfies both the average and peak limits of 15.209. 3. 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
5180	95.6	-	-	84.42	31.75	15.23	35.8	100	50	Peak
5180	85.44	-	-	74.26	31.75	15.23	35.8	100	50	Average
10360	49.24	-24.76	74	24.99	38.62	21.15	35.52	152	260	Peak

Test Mode :	802.11a	Temperature :	23~25°C
Test Channel :	36	Relative Humidity :	50~53%
Test Engineer :	Leo Liao	Polarization :	Vertical
Remark :	1. 5180 MHz is fundamental signal which can be ignored. 2. 10360 MHz is not within a restricted band and satisfies both the average and peak limits of 15.209. 3. 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
5180	88.76	-	-	77.58	31.75	15.23	35.8	102	182	Peak
5180	78.55	-	-	67.37	31.75	15.23	35.8	102	182	Average
10360	50.36	-23.64	74	26.11	38.62	21.15	35.52	152	260	Peak



Test Mode :	802.11a	Temperature :	23~25°C
Test Channel :	44	Relative Humidity :	50~53%
Test Engineer :	Leo Liao	Polarization :	Horizontal
Remark :	1. 5220 MHz is fundamental signal which can be ignored. 2. 10440 MHz is not within a restricted band and satisfies both the average and peak limits of 15.209. 3. 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
5220	94.07	-	-	82.85	31.77	15.24	35.79	100	358	Peak
5220	82.91	-	-	71.69	31.77	15.24	35.79	100	358	Average
10440	50.48	-23.52	74	26.09	38.72	21.17	35.5	125	230	Peak

Test Mode :	802.11a	Temperature :	23~25°C
Test Channel :	44	Relative Humidity :	50~53%
Test Engineer :	Leo Liao	Polarization :	Vertical
Remark :	1. 5220 MHz is fundamental signal which can be ignored. 2. 10440 MHz is not within a restricted band and satisfies both the average and peak limits of 15.209. 3. 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
5220	90.08	-	-	78.86	31.77	15.24	35.79	103	183	Peak
5220	79.04	-	-	67.82	31.77	15.24	35.79	103	183	Average
10440	50.68	-23.32	74	26.29	38.72	21.17	35.5	125	230	Peak



Test Mode :	802.11a	Temperature :	23~25°C
Test Channel :	48	Relative Humidity :	50~53%
Test Engineer :	Leo Liao	Polarization :	Horizontal
Remark :	1. 5240 MHz is fundamental signal which can be ignored. 2. 10480 MHz is not within a restricted band and satisfies both the average and peak limits of 15.209. 3. 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
5240	94.17	-	-	82.9	31.79	15.26	35.78	100	358	Peak
5240	83.64	-	-	72.37	31.79	15.26	35.78	100	358	Average
10480	50.29	-23.71	74	25.82	38.79	21.17	35.49	149	289	Peak

Test Mode :	802.11a	Temperature :	23~25°C
Test Channel :	48	Relative Humidity :	50~53%
Test Engineer :	Leo Liao	Polarization :	Vertical
Remark :	1. 5240 MHz is fundamental signal which can be ignored. 2. 10480 MHz is not within a restricted band and satisfies both the average and peak limits of 15.209. 3. 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
5240	90.53	-	-	79.26	31.79	15.26	35.78	105	181	Peak
5240	80.09	-	-	68.82	31.79	15.26	35.78	105	181	Average
10480	50.13	-23.87	74	25.66	38.79	21.17	35.49	149	289	Peak



Test Mode :	802.11a	Temperature :	23~25°C
Test Channel :	52	Relative Humidity :	50~53%
Test Engineer :	Leo Liao	Polarization :	Horizontal
Remark :	1. 5260 MHz is fundamental signal which can be ignored. 2. 10520 MHz is not within a restricted band and satisfies both the average and peak limits of 15.209. 3. 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
5260	94.19	-	-	82.88	31.81	15.28	35.78	100	1	Peak
5260	83.11	-	-	71.8	31.81	15.28	35.78	100	1	Average
10520	50.65	-23.35	74	26.11	38.84	21.18	35.48	110	220	Peak

Test Mode :	802.11a	Temperature :	23~25°C
Test Channel :	52	Relative Humidity :	50~53%
Test Engineer :	Leo Liao	Polarization :	Vertical
Remark :	1. 5260 MHz is fundamental signal which can be ignored. 2. 10520 MHz is not within a restricted band and satisfies both the average and peak limits of 15.209. 3. 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
5260	90.5	-	-	79.19	31.81	15.28	35.78	103	180	Peak
5260	80	-	-	68.69	31.81	15.28	35.78	103	180	Average
10520	49.39	-24.61	74	24.85	38.84	21.18	35.48	110	220	Peak

Test Mode :	802.11a	Temperature :	23~25°C
Test Channel :	60	Relative Humidity :	50~53%
Test Engineer :	Leo Liao	Polarization :	Horizontal
Remark :	1. 5300 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
5300	94.25	-	-	82.85	31.84	15.32	35.76	118	360	Peak
5300	83.69	-	-	72.29	31.84	15.32	35.76	118	360	Average
10600	50.3	-23.7	74	25.62	38.95	21.19	35.46	185	215	Peak

Test Mode :	802.11a	Temperature :	23~25°C
Test Channel :	60	Relative Humidity :	50~53%
Test Engineer :	Leo Liao	Polarization :	Vertical
Remark :	1. 5300 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
5300	90.29	-	-	78.89	31.84	15.32	35.76	101	191	Peak
5300	79.57	-	-	68.17	31.84	15.32	35.76	101	191	Average
10600	49.66	-24.34	74	24.98	38.95	21.19	35.46	185	215	Peak



Test Mode :	802.11a	Temperature :	23~25°C
Test Channel :	64	Relative Humidity :	50~53%
Test Engineer :	Leo Liao	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	94.09	-	-	82.68	31.85	15.32	35.76	100	359	Peak
5320	83.09	-	-	71.68	31.85	15.32	35.76	100	359	Average
10640	50.95	-23.05	74	26.2	39	21.2	35.45	152	135	Peak

Test Mode :	802.11a	Temperature :	23~25°C
Test Channel :	64	Relative Humidity :	50~53%
Test Engineer :	Leo Liao	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	94.2	-	-	82.79	31.85	15.32	35.76	101	176	Peak
5320	83.15	-	-	71.74	31.85	15.32	35.76	101	176	Average
10640	49.56	-24.44	74	24.81	39	21.2	35.45	152	135	Peak



Test Mode :	802.11a	Temperature :	23~25°C
Test Channel :	100	Relative Humidity :	50~53%
Test Engineer :	Leo Liao	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	94.02	-	-	82.27	32	15.44	35.69	104	0	Peak
5500	83.29	-	-	71.54	32	15.44	35.69	104	0	Average
11000	50.6	-23.4	74	25.2	39.5	21.25	35.35	163	230	Peak

Test Mode :	802.11a	Temperature :	23~25°C
Test Channel :	100	Relative Humidity :	50~53%
Test Engineer :	Leo Liao	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	91.31	-	-	79.56	32	15.44	35.69	116	181	Peak
5500	80.64	-	-	68.89	32	15.44	35.69	116	181	Average
11000	49.44	-24.56	74	24.04	39.5	21.25	35.35	163	230	Peak

Test Mode :	802.11a	Temperature :	23~25°C
Test Channel :	116	Relative Humidity :	50~53%
Test Engineer :	Leo Liao	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	94.28	-	-	82.31	32.11	15.51	35.65	104	360	Peak
5580	84.15	-	-	72.18	32.11	15.51	35.65	104	360	Average
11160	50.21	-23.79	74	24.9	39.35	21.27	35.31	170	200	Peak

Test Mode :	802.11a	Temperature :	23~25°C
Test Channel :	116	Relative Humidity :	50~53%
Test Engineer :	Leo Liao	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	87.76	-	-	75.79	32.11	15.51	35.65	108	353	Peak
5580	77.83	-	-	65.86	32.11	15.51	35.65	108	353	Average
11160	49.26	-24.74	74	23.95	39.35	21.27	35.31	170	200	Peak



Test Mode :	802.11a	Temperature :	23~25°C
Test Channel :	140	Relative Humidity :	50~53%
Test Engineer :	Leo Liao	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
123.31	35.56	-7.94	43.5	51.25	12.81	2	30.5	-	-	Peak
186.27	27.64	-15.86	43.5	44.66	10.88	2.53	30.43	-	-	Peak
400.54	22.95	-23.05	46	33.46	15.92	3.69	30.12	-	-	Peak
633.51	25.05	-20.95	46	30.64	19.48	4.66	29.73	-	-	Peak
802.11	38.94	-7.06	46	42.1	20.9	5.36	29.42	105	10	Peak
886.62	26.35	-19.65	46	28.1	21.83	5.69	29.27	-	-	Peak
5700	95.65	-	-	83.38	32.3	15.58	35.61	100	360	Peak
5700	84.96	-	-	72.69	32.3	15.58	35.61	100	360	Average
11400	49.6	-24.4	74	24.4	39.13	21.31	35.24	147	285	Peak



Test Mode :	802.11a	Temperature :	23~25°C
Test Channel :	140	Relative Humidity :	50~53%
Test Engineer :	Leo Liao	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
54.25	35.77	-4.23	40	57	8.06	1.27	30.56	110	330	Peak
100.01	36.65	-6.85	43.5	53.11	12.23	1.83	30.52	-	-	Peak
184.25	23.34	-20.16	43.5	40.29	10.95	2.53	30.43	-	-	Peak
360.72	18.05	-27.95	46	29.57	15.18	3.48	30.18	-	-	Peak
533.43	29.33	-16.67	46	36.47	18.37	4.37	29.88	-	-	Peak
802.11	32.16	-13.84	46	35.32	20.9	5.36	29.42	-	-	Peak
5700	92.55	-	-	80.28	32.3	15.58	35.61	102	186	Peak
5700	82.54	-	-	70.27	32.3	15.58	35.61	102	186	Average
11400	50	-24	74	24.8	39.13	21.31	35.24	147	285	Peak



Test Mode :	802.11n HT20	Temperature :	23~25°C
Test Channel :	36	Relative Humidity :	50~53%
Test Engineer :	Leo Liao	Polarization :	Horizontal
Remark :	1. 5180 MHz is fundamental signal which can be ignored. 2. 10360 MHz is not within a restricted band and satisfies both the average and peak limits of 15.209. 3. 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
5180	94.03	-	-	82.85	31.75	15.23	35.8	100	57	Peak
5180	83.01	-	-	71.83	31.75	15.23	35.8	100	57	Average
10360	48.97	-25.03	74	24.72	38.62	21.15	35.52	152	260	Peak

Test Mode :	802.11n HT20	Temperature :	23~25°C
Test Channel :	36	Relative Humidity :	50~53%
Test Engineer :	Leo Liao	Polarization :	Vertical
Remark :	1. 5180 MHz is fundamental signal which can be ignored. 2. 10360 MHz is not within a restricted band and satisfies both the average and peak limits of 15.209. 3. 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
5180	89.01	-	-	77.83	31.75	15.23	35.8	115	178	Peak
5180	78.36	-	-	67.18	31.75	15.23	35.8	115	178	Average
10360	49.24	-24.76	74	24.99	38.62	21.15	35.52	152	260	Peak



Test Mode :	802.11n HT20	Temperature :	23~25°C
Test Channel :	44	Relative Humidity :	50~53%
Test Engineer :	Leo Liao	Polarization :	Horizontal
Remark :	1. 5220 MHz is fundamental signal which can be ignored. 2. 10440 MHz is not within a restricted band and satisfies both the average and peak limits of 15.209. 3. 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
5220	93.78	-	-	82.56	31.77	15.24	35.79	100	55	Peak
5220	83	-	-	71.78	31.77	15.24	35.79	100	55	Average
10440	48.67	-25.33	74	24.28	38.72	21.17	35.5	125	230	Peak

Test Mode :	802.11n HT20	Temperature :	23~25°C
Test Channel :	44	Relative Humidity :	50~53%
Test Engineer :	Leo Liao	Polarization :	Vertical
Remark :	1. 5220 MHz is fundamental signal which can be ignored. 2. 10440 MHz is not within a restricted band and satisfies both the average and peak limits of 15.209. 3. 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
5220	89.81	-	-	78.59	31.77	15.24	35.79	103	178	Peak
5220	78.91	-	-	67.69	31.77	15.24	35.79	103	178	Average
10440	48.72	-25.28	74	24.33	38.72	21.17	35.5	125	230	Peak



Test Mode :	802.11n HT20	Temperature :	23~25°C
Test Channel :	48	Relative Humidity :	50~53%
Test Engineer :	Leo Liao	Polarization :	Horizontal
Remark :	1. 5240 MHz is fundamental signal which can be ignored. 2. 10480 MHz is not within a restricted band and satisfies both the average and peak limits of 15.209. 3. 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
5240	93.29	-	-	82.02	31.79	15.26	35.78	100	55	Peak
5240	82.95	-	-	71.68	31.79	15.26	35.78	100	55	Average
10480	49.05	-24.95	74	24.58	38.79	21.17	35.49	149	289	Peak

Test Mode :	802.11n HT20	Temperature :	23~25°C
Test Channel :	48	Relative Humidity :	50~53%
Test Engineer :	Leo Liao	Polarization :	Vertical
Remark :	1. 5240 MHz is fundamental signal which can be ignored. 2. 10480 MHz is not within a restricted band and satisfies both the average and peak limits of 15.209. 3. 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
5240	89.45	-	-	78.18	31.79	15.26	35.78	112	184	Peak
5240	79	-	-	67.73	31.79	15.26	35.78	112	184	Average
10480	47.9	-26.1	74	23.43	38.79	21.17	35.49	149	289	Peak



Test Mode :	802.11n HT20	Temperature :	23~25°C
Test Channel :	52	Relative Humidity :	50~53%
Test Engineer :	Leo Liao	Polarization :	Horizontal
Remark :	1. 5260 MHz is fundamental signal which can be ignored. 2. 10520 MHz is not within a restricted band and satisfies both the average and peak limits of 15.209. 3. 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
5260	92.16	-	-	80.85	31.81	15.28	35.78	100	55	Peak
5260	81.11	-	-	69.8	31.81	15.28	35.78	100	55	Average
10520	47.4	-26.6	74	22.86	38.84	21.18	35.48	110	220	Peak

Test Mode :	802.11n HT20	Temperature :	23~25°C
Test Channel :	52	Relative Humidity :	50~53%
Test Engineer :	Leo Liao	Polarization :	Vertical
Remark :	1. 5260 MHz is fundamental signal which can be ignored. 2. 10520 MHz is not within a restricted band and satisfies both the average and peak limits of 15.209. 3. 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
5260	89.17	-	-	77.86	31.81	15.28	35.78	102	179	Peak
5260	78.49	-	-	67.18	31.81	15.28	35.78	102	179	Average
10520	46.98	-27.02	74	22.44	38.84	21.18	35.48	110	220	Peak

Test Mode :	802.11n HT20	Temperature :	23~25°C
Test Channel :	60	Relative Humidity :	50~53%
Test Engineer :	Leo Liao	Polarization :	Horizontal
Remark :	1. 5300 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
5300	91.45	-	-	80.05	31.84	15.32	35.76	109	52	Peak
5300	80.96	-	-	69.56	31.84	15.32	35.76	109	52	Average
10600	48.67	-25.33	74	23.99	38.95	21.19	35.46	185	215	Peak

Test Mode :	802.11n HT20	Temperature :	23~25°C
Test Channel :	60	Relative Humidity :	50~53%
Test Engineer :	Leo Liao	Polarization :	Vertical
Remark :	1. 5300 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
5300	90.25	-	-	78.85	31.84	15.32	35.76	100	173	Peak
5300	79.36	-	-	67.96	31.84	15.32	35.76	100	173	Average
10600	46.69	-27.31	74	22.01	38.95	21.19	35.46	185	215	Peak

Test Mode :	802.11n HT20	Temperature :	23~25°C
Test Channel :	64	Relative Humidity :	50~53%
Test Engineer :	Leo Liao	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	91.77	-	-	80.36	31.85	15.32	35.76	108	53	Peak
5320	80.44	-	-	69.03	31.85	15.32	35.76	108	53	Average
10640	47.13	-26.87	74	22.38	39	21.2	35.45	152	135	Peak

Test Mode :	802.11n HT20	Temperature :	23~25°C
Test Channel :	64	Relative Humidity :	50~53%
Test Engineer :	Leo Liao	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	90.39	-	-	78.98	31.85	15.32	35.76	110	185	Peak
5320	79.58	-	-	68.17	31.85	15.32	35.76	110	185	Average
10640	47.13	-26.87	74	22.38	39	21.2	35.45	152	135	Peak



Test Mode :	802.11n HT20	Temperature :	23~25°C
Test Channel :	100	Relative Humidity :	50~53%
Test Engineer :	Leo Liao	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	91.59	-	-	79.84	32	15.44	35.69	103	360	Peak
5500	79.87	-	-	68.12	32	15.44	35.69	103	360	Average
11000	48.97	-25.03	74	23.57	39.5	21.25	35.35	163	230	Peak

Test Mode :	802.11n HT20	Temperature :	23~25°C
Test Channel :	100	Relative Humidity :	50~53%
Test Engineer :	Leo Liao	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	84.66	-	-	72.91	32	15.44	35.69	100	0	Peak
5500	73.02	-	-	61.27	32	15.44	35.69	100	0	Average
11000	47.93	-26.07	74	22.53	39.5	21.25	35.35	163	230	Peak



Test Mode :	802.11n HT20	Temperature :	23~25°C
Test Channel :	116	Relative Humidity :	50~53%
Test Engineer :	Leo Liao	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	91.39	-	-	79.42	32.11	15.51	35.65	100	0	Peak
5580	80.13	-	-	68.16	32.11	15.51	35.65	100	0	Average
11160	48.16	-25.84	74	22.85	39.35	21.27	35.31	170	200	Peak

Test Mode :	802.11n HT20	Temperature :	23~25°C
Test Channel :	116	Relative Humidity :	50~53%
Test Engineer :	Leo Liao	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	93.22	-	-	81.25	32.11	15.51	35.65	103	173	Peak
5580	81.72	-	-	69.75	32.11	15.51	35.65	103	173	Average
11160	48.22	-25.78	74	22.91	39.35	21.27	35.31	170	200	Peak

Test Mode :	802.11n HT20	Temperature :	23~25°C
Test Channel :	140	Relative Humidity :	50~53%
Test Engineer :	Leo Liao	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	94.33	-	-	82.06	32.3	15.58	35.61	100	0	Peak
5700	83.34	-	-	71.07	32.3	15.58	35.61	100	0	Average
11400	48.45	-25.55	74	23.25	39.13	21.31	35.24	147	285	Peak

Test Mode :	802.11n HT20	Temperature :	23~25°C
Test Channel :	140	Relative Humidity :	50~53%
Test Engineer :	Leo Liao	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	92.96	-	-	80.69	32.3	15.58	35.61	100	173	Peak
5700	81.77	-	-	69.5	32.3	15.58	35.61	100	173	Average
11400	47.15	-26.85	74	21.95	39.13	21.31	35.24	147	285	Peak



Test Mode :	802.11n HT40	Temperature :	23~25°C
Test Channel :	38	Relative Humidity :	50~53%
Test Engineer :	Leo Liao	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. 3. 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
5190	91.33	-	-	80.15	31.75	15.23	35.8	100	58	Peak
5190	80.67	-	-	69.49	31.75	15.23	35.8	100	58	Average
10380	47.09	-26.91	74	22.8	38.65	21.16	35.52	152	260	Peak

Test Mode :	802.11n HT40	Temperature :	23~25°C
Test Channel :	38	Relative Humidity :	50~53%
Test Engineer :	Leo Liao	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. 3. 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
5190	82.75	-	-	71.57	31.75	15.23	35.8	103	300	Peak
5190	72.28	-	-	61.1	31.75	15.23	35.8	103	300	Average
10380	48.19	-25.81	74	23.9	38.65	21.16	35.52	152	260	Peak



Test Mode :	802.11n HT40	Temperature :	23~25°C
Test Channel :	46	Relative Humidity :	50~53%
Test Engineer :	Leo Liao	Polarization :	Horizontal
Remark :	1. 5230 MHz is fundamental signal which can be ignored. 2. 10460 MHz is not within a restricted band and satisfies both the average and peak limits of 15.209. 3. 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
5230	95.33	-	-	84.06	31.79	15.26	35.78	100	55	Peak
5230	83.74	-	-	72.47	31.79	15.26	35.78	100	55	Average
10460	49.42	-24.58	74	25.01	38.74	21.17	35.5	125	230	Peak

Test Mode :	802.11n HT40	Temperature :	23~25°C
Test Channel :	46	Relative Humidity :	50~53%
Test Engineer :	Leo Liao	Polarization :	Vertical
Remark :	1. 5230 MHz is fundamental signal which can be ignored. 2. 10460 MHz is not within a restricted band and satisfies both the average and peak limits of 15.209. 3. 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
5230	89.16	-	-	77.89	31.79	15.26	35.78	101	188	Peak
5230	78.36	-	-	67.09	31.79	15.26	35.78	101	188	Average
10460	47.89	-26.11	74	23.48	38.74	21.17	35.5	125	230	Peak



Test Mode :	802.11n HT40	Temperature :	23~25°C
Test Channel :	54	Relative Humidity :	50~53%
Test Engineer :	Leo Liao	Polarization :	Horizontal
Remark :	1. 5270 MHz is fundamental signal which can be ignored. 2. 10540 MHz is not within a restricted band and satisfies both the average and peak limits of 15.209. 3. 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
5270	93.92	-	-	82.61	31.81	15.28	35.78	100	58	Peak
5270	82.63	-	-	71.32	31.81	15.28	35.78	100	58	Average
10540	46.98	-27.02	74	22.41	38.86	21.18	35.47	110	220	Peak

Test Mode :	802.11n HT40	Temperature :	23~25°C
Test Channel :	54	Relative Humidity :	50~53%
Test Engineer :	Leo Liao	Polarization :	Vertical
Remark :	1. 5270 MHz is fundamental signal which can be ignored. 2. 10540 MHz is not within a restricted band and satisfies both the average and peak limits of 15.209. 3. 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
5270	89.69	-	-	78.38	31.81	15.28	35.78	100	190	Peak
5270	78.77	-	-	67.46	31.81	15.28	35.78	100	190	Average
10540	46.7	-27.3	74	22.13	38.86	21.18	35.47	110	220	Peak

Test Mode :	802.11n HT40	Temperature :	23~25°C
Test Channel :	62	Relative Humidity :	50~53%
Test Engineer :	Leo Liao	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	92.2	-	-	80.79	31.85	15.32	35.76	109	0	Peak
5310	81.74	-	-	70.33	31.85	15.32	35.76	109	0	Average
10620	47.28	-26.72	74	22.56	38.98	21.19	35.45	185	215	Peak

Test Mode :	802.11n HT40	Temperature :	23~25°C
Test Channel :	62	Relative Humidity :	50~53%
Test Engineer :	Leo Liao	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	86.87	-	-	75.46	31.85	15.32	35.76	102	172	Peak
5310	75.94	-	-	64.53	31.85	15.32	35.76	102	172	Average
10620	47.64	-26.36	74	22.92	38.98	21.19	35.45	185	215	Peak



Test Mode :	802.11n HT40	Temperature :	23~25°C
Test Channel :	102	Relative Humidity :	50~53%
Test Engineer :	Leo Liao	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	91.46	-	-	79.68	32	15.46	35.68	103	56	Peak
5510	79.99	-	-	68.21	32	15.46	35.68	103	56	Average
11020	46	-28	74	20.61	39.48	21.25	35.34	163	230	Peak

Test Mode :	802.11n HT40	Temperature :	23~25°C
Test Channel :	102	Relative Humidity :	50~53%
Test Engineer :	Leo Liao	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	88.57	-	-	76.79	32	15.46	35.68	106	174	Peak
5510	78.16	-	-	66.38	32	15.46	35.68	106	174	Average
11020	46.55	-27.45	74	21.16	39.48	21.25	35.34	163	230	Peak

Test Mode :	802.11n HT40	Temperature :	23~25°C
Test Channel :	110	Relative Humidity :	50~53%
Test Engineer :	Leo Liao	Polarization :	Horizontal
Remark :	1. 5550 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
5550	91.71	-	-	79.82	32.08	15.48	35.67	100	359	Peak
5550	78.65	-	-	66.76	32.08	15.48	35.67	100	359	Average
11100	47.97	-26.03	74	22.61	39.41	21.27	35.32	163	230	Peak

Test Mode :	802.11n HT40	Temperature :	23~25°C
Test Channel :	110	Relative Humidity :	50~53%
Test Engineer :	Leo Liao	Polarization :	Vertical
Remark :	1. 5550 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
5550	87.85	-	-	75.96	32.08	15.48	35.67	117	176	Peak
5550	76.81	-	-	64.92	32.08	15.48	35.67	117	176	Average
11100	47.87	-26.13	74	22.51	39.41	21.27	35.32	163	230	Peak



Test Mode :	802.11n HT40	Temperature :	23~25°C
Test Channel :	134	Relative Humidity :	50~53%
Test Engineer :	Leo Liao	Polarization :	Horizontal
Remark :	1. 5670 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
5670	94.41	-	-	82.18	32.28	15.57	35.62	100	55	Peak
5670	82.99	-	-	70.76	32.28	15.57	35.62	100	55	Average
11340	48.24	-25.76	74	23.01	39.19	21.3	35.26	170	200	Peak

Test Mode :	802.11n HT40	Temperature :	23~25°C
Test Channel :	134	Relative Humidity :	50~53%
Test Engineer :	Leo Liao	Polarization :	Vertical
Remark :	1. 5670 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
5670	91.9	-	-	79.67	32.28	15.57	35.62	103	178	Peak
5670	80	-	-	67.77	32.28	15.57	35.62	103	178	Average
11340	47.73	-26.27	74	22.5	39.19	21.3	35.26	170	200	Peak

3.5 AC Conducted Emission Measurement

3.5.1 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.

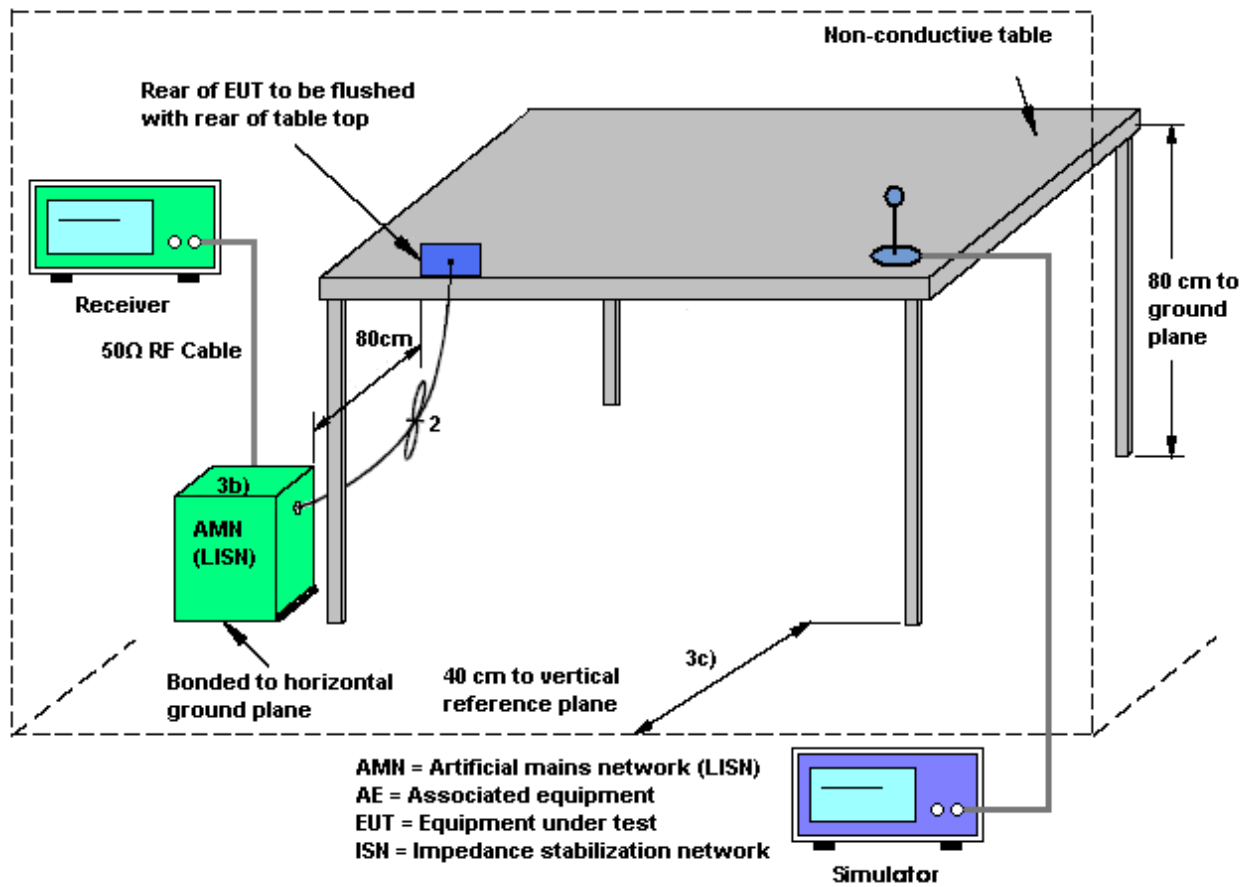
3.5.2 Measuring Instruments

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

3.5.3 Test Procedures

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

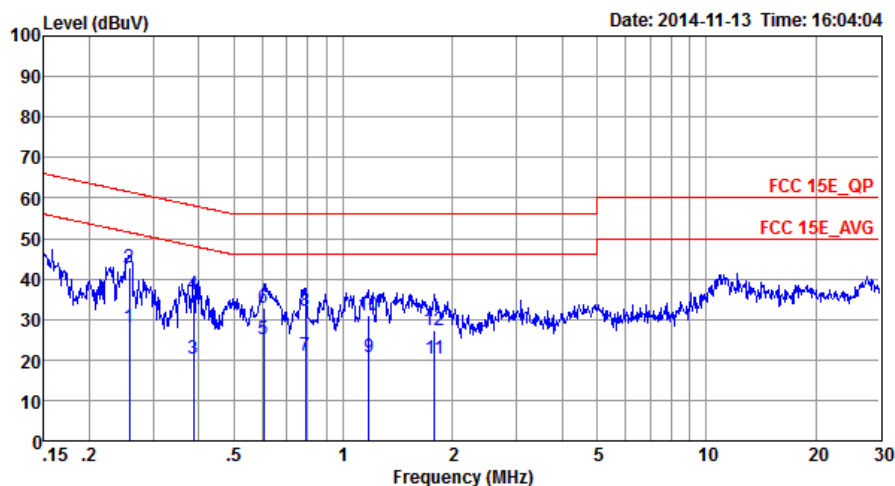
3.5.4 Test Setup





3.5.5 Test Result of AC Conducted Emission

Test Mode :	Mode 1	Temperature :	21~22℃
Test Engineer :	Jack Tian	Relative Humidity :	41~42%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	GSM1900 Idle + Bluetooth Link + WLAN 5GHz Link + USB Cable (Charging from Adapter) + Earphone		

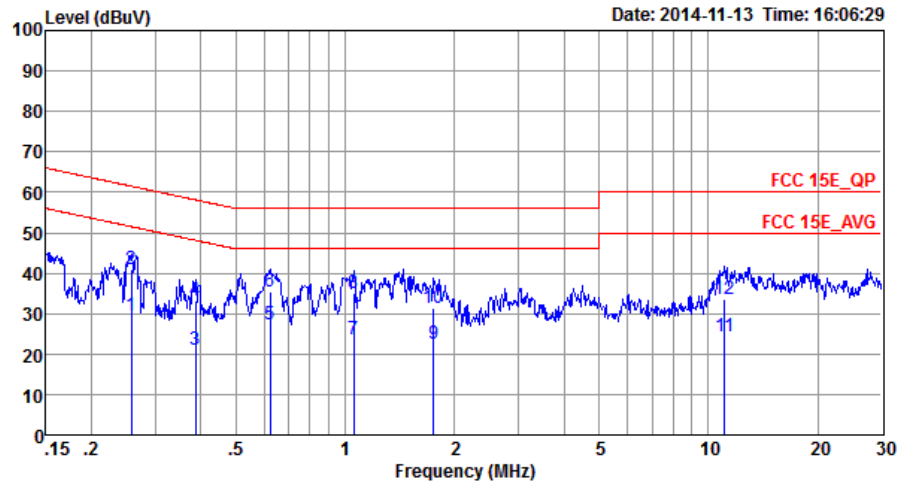


Site : C001-SZ
Condition: FCC 15E_QP LISN_L_20140304 LINE

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.26	28.18	-23.33	51.51	17.70	0.24	10.24	Average
2 *	0.26	42.68	-18.83	61.51	32.20	0.24	10.24	QP
3	0.39	20.25	-27.87	48.12	9.80	0.28	10.17	Average
4	0.39	36.25	-21.87	58.12	25.80	0.28	10.17	QP
5	0.60	24.98	-21.02	46.00	14.60	0.23	10.15	Average
6	0.60	32.98	-23.02	56.00	22.60	0.23	10.15	QP
7	0.79	21.16	-24.84	46.00	10.80	0.21	10.15	Average
8	0.79	32.26	-23.74	56.00	21.90	0.21	10.15	QP
9	1.18	20.81	-25.19	46.00	10.40	0.25	10.16	Average
10	1.18	30.91	-25.09	56.00	20.50	0.25	10.16	QP
11	1.78	20.41	-25.59	46.00	10.00	0.23	10.18	Average
12	1.78	27.21	-28.79	56.00	16.80	0.23	10.18	QP



Test Mode :	Mode 1	Temperature :	21~22°C
Test Engineer :	Jack Tian	Relative Humidity :	41~42%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	GSM1900 Idle + Bluetooth Link + WLAN 5GHz Link + USB Cable (Charging from Adapter) + Earphone		



Site : CO01-SZ
Condition: FCC 15E_QP LISN_N_20140304 NEUTRAL

	Freq	Level	Over	Limit	Read	LISN	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
			dB	dBuV	dBuV	dB	dB	
1	0.26	29.38	-22.13	51.51	18.80	0.34	10.24	Average
2	0.26	41.08	-20.43	61.51	30.50	0.34	10.24	QP
3	0.39	21.16	-26.96	48.12	10.60	0.39	10.17	Average
4	0.39	33.26	-24.86	58.12	22.70	0.39	10.17	QP
5 *	0.62	27.36	-18.64	46.00	16.90	0.31	10.15	Average
6	0.62	35.56	-20.44	56.00	25.10	0.31	10.15	QP
7	1.05	23.79	-22.21	46.00	13.31	0.33	10.15	Average
8	1.05	35.19	-20.81	56.00	24.71	0.33	10.15	QP
9	1.75	22.44	-23.56	46.00	11.90	0.36	10.18	Average
10	1.75	31.34	-24.66	56.00	20.80	0.36	10.18	QP
11	11.08	24.41	-25.59	50.00	13.10	0.94	10.37	Average
12	11.08	33.41	-26.59	60.00	22.10	0.94	10.37	QP

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.

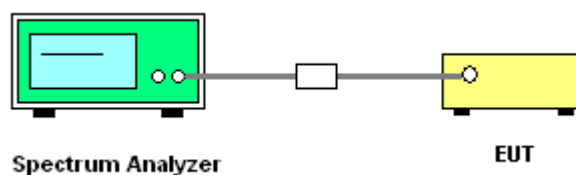
3.6.2 Measuring Instruments

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	Test Engineer :	Mygai Mo
-------------	-----------------	-----------------	----------

Mod.	Data Rate	NTX	Channel	Freq. (MHz)	Center Frequency (MHz)	Frequency Deviation (MHz)	Frequency Stability (ppm)	Temperature (°C)	Voltage (V)
11a	6Mbps	1	36	5180	5180.000	0.000	0.00	25	3.6
11a	6Mbps	1	36	5180	5180.000	0.000	0.00	25	4.35
11a	6Mbps	1	36	5180	5180.000	0.000	0.00	25	3.8
11a	6Mbps	1	36	5180	5180.000	0.000	0.00	-30	3.8
11a	6Mbps	1	36	5180	5180.000	0.000	0.00	50	3.8

Mod.	Data Rate	NTX	Channel	Freq. (MHz)	Center Frequency (MHz)	Frequency Deviation (MHz)	Frequency Stability (ppm)	Temperature (°C)	Voltage (V)
11a	6Mbps	1	64	5320	5320.000	0.000	0.00	25	3.6
11a	6Mbps	1	64	5320	5320.000	0.000	0.00	25	4.35
11a	6Mbps	1	64	5320	5320.000	0.000	0.00	25	3.8
11a	6Mbps	1	64	5320	5320.000	0.000	0.00	-30	3.8
11a	6Mbps	1	64	5320	5320.050	0.050	9.40	50	3.8

Mod.	Data Rate	NTX	Channel	Freq. (MHz)	Center Frequency (MHz)	Frequency Deviation (MHz)	Frequency Stability (ppm)	Temperature (°C)	Voltage (V)
11a	6Mbps	1	100	5500	5500.000	0.000	0.00	25	3.6
11a	6Mbps	1	100	5500	5500.000	0.000	0.00	25	4.35
11a	6Mbps	1	100	5500	5500.000	0.000	0.00	25	3.8
11a	6Mbps	1	100	5500	5500.050	0.050	9.09	-30	3.8
11a	6Mbps	1	100	5500	5499.950	-0.050	-9.09	50	3.8

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 Equipments

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSP30	101400	9kHz~30GHz	Mar. 03, 2014	Nov. 22, 2014	Mar. 02, 2015	Conducted (TH01-SZ)
Power Meter	Anritsu	ML2495A	1218010	13dBm ~-20dBm	Mar. 03, 2014	Nov. 22, 2014	Mar. 02, 2015	Conducted (TH01-SZ)
Power Sensor	Dare	RPR3006W	TH01SZ00019	0.3GHz~6GHz	Mar. 14, 2014	Nov. 22, 2014	Mar. 13, 2015	Conducted (TH01-SZ)
ESCIO TEST Receiver	R&S	ESCI	100724	9kHz~3GHz	Feb. 21, 2014	Nov. 26, 2014	Feb. 20, 2015	Radiation (03CH01-SZ)
Spectrum Analyzer	Agilent Technologies	N9038A	MY52260185	20Hz~26.5GHz	May 26, 2014	Nov. 26, 2014	May 25, 2015	Radiation (03CH01-SZ)
Loop Antenna	R&S	HFH2-Z2	100354	9kHz~30MHz	May 09, 2014	Nov. 26, 2014	May 08, 2015	Radiation (03CH01-SZ)
Bilog Antenna	TESEQ	CBL 6112D	37877	30MHz~2GHz	Oct. 15, 2014	Nov. 26, 2014	Oct. 14, 2015	Radiation (03CH01-SZ)
Double Ridge Horn Antenna	ETS Lindgren	3117	00119436	1GHz~18GHz	Oct. 15, 2014	Nov. 26, 2014	Oct. 14, 2015	Radiation (03CH01-SZ)
Double Ridged Horn Antenna	COM-POWER	AH-840	101073	18GHz~40GHz	Jun. 09, 2014	Nov. 26, 2014	Jun. 08, 2015	Radiation (03CH01-SZ)
Amplifier	ADVANTEST	BB525C	E9007003	9kHz~3000MHz	Feb. 21, 2014	Nov. 26, 2014	Feb. 20, 2015	Radiation (03CH01-SZ)
Amplifier	Yiai	AV3860B	04030	2GHz~26.5GHz	May 08, 2014	Nov. 26, 2014	May 07, 2015	Radiation (03CH01-SZ)
AC Source(AVR)	Chroma	61601	616010001985	100Vac~250Vac	Mar. 25, 2014	Nov. 26, 2014	Mar. 24, 2015	Radiation (03CH01-SZ)
Turn Table	EM Electronics	EM 1000	N/A	0~360 degree	NCR	Nov. 26, 2014	NCR	Radiation (03CH01-SZ)
Antenna Mast	EM Electronics	EM 1000	N/A	1 m~4 m	NCR	Nov. 26, 2014	NCR	Radiation (03CH01-SZ)
ESCIO TEST Receiver	R&S	ESCI	100724	9kHz~3GHz	Feb. 21, 2014	Nov. 13, 2014	Feb. 20, 2015	Conduction (CO01-SZ)
AC LISN	EMCO	3816/2SH	00103912	9kHz~30MHz	Mar. 04, 2014	Nov. 13, 2014	Mar. 03, 2015	Conduction (CO01-SZ)
AC LISN (for auxiliary equipment)	EMCO	3816/2SH	00103892	9kHz~30MHz	Mar. 04, 2014	Nov. 13, 2014	Mar. 03, 2015	Conduction (CO01-SZ)
AC Power Source	Chroma	61602	616020000891	100Vac~250Vac	Dec. 17, 2013	Nov. 13, 2014	Dec. 16, 2014	Conduction (CO01-SZ)



5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	2.3 dB
---	--------

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	3.9 dB
---	--------