FCC RF Test Report

APPLICANT	**:**	**ZTE CORPORATION**
EQUIPMENT	**:**	**LTE Ufi**
BRAND NAME	**:**	**ZTE**
MODEL NAME	**:**	**MF97G**
FCC ID	**:**	**SRQ-MF97G**
STANDARD	**:**	**FCC Part 15 Subpart E §15.407**
CLASSIFICATION	**:**	**(NII) Unlicensed National Information Infrastructure**

The product testing was completed on May 04, 2015. We, SPORTON INTERNATIONAL (KUNSHAN) 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 (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. China

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR542003E	Rev. 01	Initial issue of report	May 28, 2015

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.403(i)	6dB Bandwidth	> 500kHz	Pass	-
3.2	15.407(a)	Maximum Conducted Output Power	≤ 30 dBm	Pass	-
3.3	15.407(a)	Power Spectral Density	≤ 30 dBm/500kHz	Pass	-
3.4	15.407(b)	Unwanted Emissions	≤ -17, -27 dBm/MHz &15.209(a)	Pass	Under limit 3.61 dB at 5714.680 MHz
3.5	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 15.79 dB at 0.160 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

ZTE CORPORATION

ZTE Plaza, Keji Road South, Hi-Tech Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P. R. China

1.2 Manufacturer

ZTE CORPORATION

ZTE Plaza, Keji Road South, Hi-Tech Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P. R. China

1.3 Feature of Equipment Under Test

Product Feature	
Equipment	LTE Ufi
Brand Name	ZTE
Model Name	MF97G
FCC ID	SRQ-MF97G
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 LE
HW Version	d96C
SW Version	SPRO2GV1.0.0B01
EUT Stage	Identical Prototype

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

1.4 Product Specification of Equipment Under Test

<table>
<tr><th colspan="2">Product Specification subjective to this standard</th></tr>
<tr><td>Tx/Rx Channel Frequency Range</td><td>5725 MHz ~ 5850 MHz</td></tr>
<tr><td>Maximum Output Power</td><td>802.11a : 11.51 dBm / 0.0142 W
802.11n HT20 : 14.08 dBm / 0.0256 W
802.11n HT40 : 11.60 dBm / 0.0145 W</td></tr>
<tr><td>Minimum 6dB Bandwidth</td><td>802.11a : 16.36 MHz
802.11n HT20 : 17.60 MHz
802.11n HT40 : 36.36 MHz</td></tr>
<tr><td>Antenna Type / Gain</td><td>Chain Port 0 : IFA Antenna with gain 1.70 dBi
Chain Port 1 : IFA Antenna with gain 2.85 dBi</td></tr>
<tr><td>Type of Modulation</td><td>802.11a/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)</td></tr>
<tr><td>Antenna Function Description</td><td>
<table>
<tr><th></th><th>Chain Port 0</th><th>Chain Port 1</th></tr>
<tr><td>802.11a</td><td>V</td><td>V</td></tr>
<tr><td>802.11n SISO</td><td>V</td><td>V</td></tr>
<tr><td>802.11n MIMO</td><td>V</td><td>V</td></tr>
</table>
</td></tr>
</table>

1.5 Modification of EUT

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

1.6 Testing Location

Test Site	SPORTON INTERNATIONAL (KUNSHAN) INC.			
Test Site Location	No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P. R. China TEL: +86-0512-5790-0158 FAX: +86-0512-5790-0958			
Test Site No.	**Sporton Site No.**			**FCC Registration No.**
	TH01-KS	03CH02-KS	CO01-KS	418269

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
- FCC KDB 662911 D01 Multiple Transmitter Output v02r01.
- ANSI C63.10-2013

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. FCC permits the use of the 1.5 meter table as an alternative in C63.10-2013 through inquiry tracking number 961829.
3. 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 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 and Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5725-5850 MHz Band 4 (U-NII-3)	149	5745	157	5785
	151	**5755**	**159**	**5795**
	153	5765	161	5805
	155	5775	165	5825

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.

WLAN 5GHz 802.11a Average Power (dBm)											
Power vs. Channel				Power vs. Data Rate							
Channel	Frequency (MHz)	Chain Port	Data Rate 6Mbps	Channel	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
CH 149	5745	0	**11.51**	CH 149	11.43	11.46	11.45	11.39	11.48	11.40	11.44
CH 157	5785	0	11.10								
CH 165	5825	0	11.03								
CH 149	5745	1	**10.54**	CH 149	10.49	10.43	10.38	10.47	10.51	10.48	10.45
CH 157	5785	1	9.94								
CH 165	5825	1	9.54								

WLAN 5GHz 802.11n-HT20 Output Power (dBm)											
Power vs. Channel				Power vs. Data Rate							
Channel	Frequency (MHz)	Chain Port	MCS Index MCS0	Channel	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 149	5745	0	**11.45**	CH 149	11.34	11.40	11.33	11.42	11.38	11.30	11.39
CH 157	5785	0	10.81								
CH 165	5825	0	10.79								
CH 149	5745	1	**10.43**	CH 149	10.33	10.27	10.36	10.35	10.40	10.38	10.31
CH 157	5785	1	10.19								
CH 165	5825	1	9.85								
CH 149	5745	0+1(0)	11.62	CH 149	11.47	11.52	11.49	11.57	11.56	11.60	11.59
CH 157	5785	0+1(0)	11.20								
CH 165	5825	0+1(0)	11.12								
CH 149	5745	0+1(1)	10.43	CH 149	10.33	10.31	10.37	10.39	10.36	10.41	10.34
CH 157	5785	0+1(1)	10.26								
CH 165	5825	0+1(1)	9.96								
CH 149	5745	0+1	**14.08**	CH 149	13.95	13.97	13.98	14.03	14.01	14.05	14.02
CH 157	5785	0+1	13.77								
CH 165	5825	0+1	13.59								

WLAN 5GHz 802.11n-HT40 Output Power (dBm)											
Power vs. Channel				Power vs. Data Rate							
Channel	Frequency (MHz)	Chain Port	MCS Index MCS0	Channel	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 151	5755	0	**8.95**	CH 151	8.83	8.85	8.90	8.88	8.93	8.87	8.92
CH 159	5795	0	8.65								
CH 151	5755	1	8.52	CH 159	8.80	8.84	8.88	8.91	8.86	8.83	8.89
CH 159	5795	1	**8.92**								
CH 151	5755	0+1(0)	8.80	CH 151	8.63	8.63	8.74	8.79	8.74	8.69	8.62
CH 159	5795	0+1(0)	8.71								
CH 151	5755	0+1(1)	8.36	CH 151	8.08	7.90	7.05	7.95	8.03	8.33	8.35
CH 159	5795	0+1(1)	8.27								
CH 151	5755	0+1	**11.60**	CH 151	11.37	11.29	10.99	11.40	11.41	11.52	11.50
CH 159	5795	0+1	11.51								

Note: Chain Port 0+1 is a calculated result from sum of the power Chain Port 0+1(0) and Chain Port 0+1(1).

2.3 Test Mode

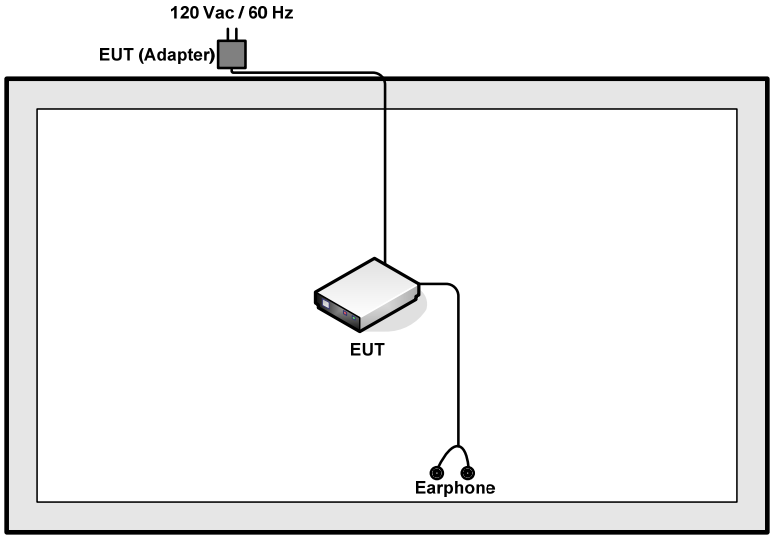
Final results of test modes, data rates and test channels are shown as following table.

Test Cases				
	Test Items	**Mode**	**Data rate**	**Test Channel**
Conducted TCs	**6dB Bandwidth Power Spectral Density**	**802.11a**	**6 Mbps**	**L/M/H**
		802.11n HT20	**MCS0**	**L/M/H**
		802.11n HT40	**MCS0**	**L/H**
	Output Power	**802.11a**	**6 Mbps**	**L/M/H**
		802.11n HT20	**MCS0**	**L/M/H**
		802.11n HT40	**MCS0**	**L/H**
	Frequency Stability	**802.11a**	**6 Mbps**	**L**
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/H**
AC Conducted Emission	Mode 1 ： Bluetooth Link + WLAN (5G) Link + Earphone + Adapter			
Remark: For radiated TCs, the tests were performed with adapter, earphone and USB cable.				

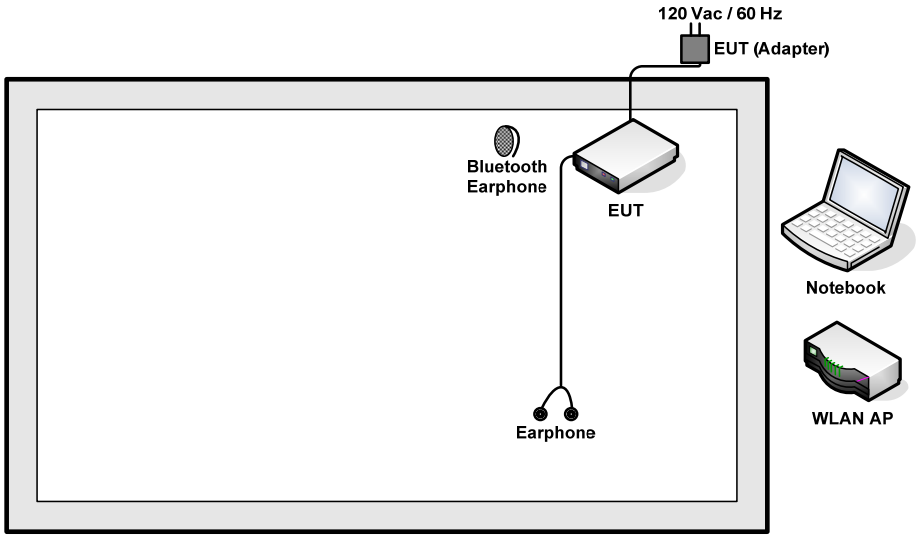
Ch. #		**Band IV：5725-5850 MHz**		
		802.11a	**802.11n HT20**	**802.11n HT40**
L	**Low**	149	149	151
M	**Middle**	157	157	-
H	**High**	165	165	159

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.	WLAN AP	LINKSYS	WRT600N	Q87-WRT600NV11	N/A	Unshielded, 1.8 m
2.	Notebook	Lenovo	G480	N/A	N/A	AC I/P: Unshielded, 0.9 m DC O/P: Shielded, 1.8 m
3.	Bluetooth Earphone	Nokia	BH-106	QTLBH-106	N/A	N/A
4.	Earphone	Lenovo	SH100	N/A	Unshielded, 1.2 m	N/A
5.	DC Power Supply	GWINSTEK	GPS-3030D	N/A	N/A	Unshielded, 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.

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 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.
Offset = RF cable loss.
Following shows an offset computation example with cable loss 7.5 dB.

Offset (dB) = RF cable loss(dB).
= 7.5 (dB)

3 Test Result

3.1 6dB Bandwidth Measurement

3.1.1 Description of 6dB Bandwidth

The minimum 6 dB bandwidth shall be at least 500 kHz.

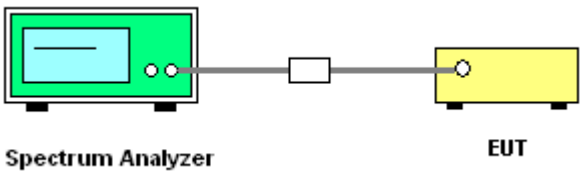
3.1.2 Measuring Instruments

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 for the band 5.725-5.85GHz
2. Set RBW = 100kHz.
3. Set the VBW ≥ 3 x RBW.
4. Detector = Peak.
5. Trace mode = max hold
6. Measure the maximum width of the emission that is 6 dB down from the peak of the emission.
7. Measure and record the results in the test report.

3.1.4 Test Setup

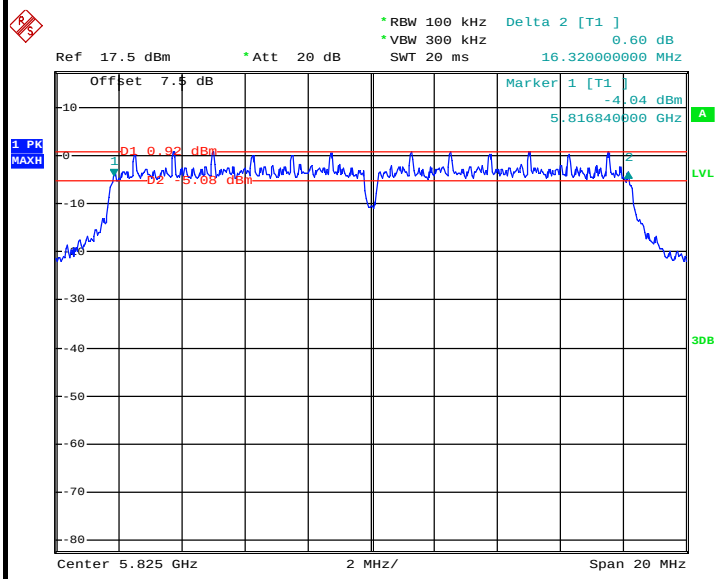


3.1.5 Test Result of 6dB Bandwidth

Test Band :	5GHz band 4	Temperature :	24~25℃
Test Engineer :	Issac Song	Relative Humidity :	49~51%

Mod.	Data Rate	NTX	Channel	Freq. (MHz)	6 dB Bandwidth (MHz)		FCC 6 dB Bandwidth Min. Limit (MHz)		Pass/Fail
					Chain Port 0	Chain Port 1	Chain Port 0	Chain Port 1	
11a	6Mbps	1	149	5745	16.36	-	0.5	0.5	Pass
11a	6Mbps	1	157	5785	16.36	-	0.5	0.5	Pass
11a	6Mbps	1	165	5825	16.32	-	0.5	0.5	Pass
HT20	MCS0	1	149	5745	17.60	-	0.5	0.5	Pass
HT20	MCS0	1	157	5785	17.60	-	0.5	0.5	Pass
HT20	MCS0	1	165	5825	17.60	-	0.5	0.5	Pass
HT40	MCS0	1	151	5755	36.28	-	0.5	0.5	Pass
HT40	MCS0	1	159	5795	36.36	-	0.5	0.5	Pass
HT20	MCS0	2	149	5745	17.60	17.56	0.5		Pass
HT20	MCS0	2	157	5785	17.60	17.60	0.5		Pass
HT20	MCS0	2	165	5825	17.56	17.60	0.5		Pass
HT40	MCS0	2	151	5755	36.32	36.32	0.5		Pass
HT40	MCS0	2	159	5795	36.32	36.32	0.5		Pass

Minimum 6dB Bandwidth



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 the band 5.725–5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.

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.

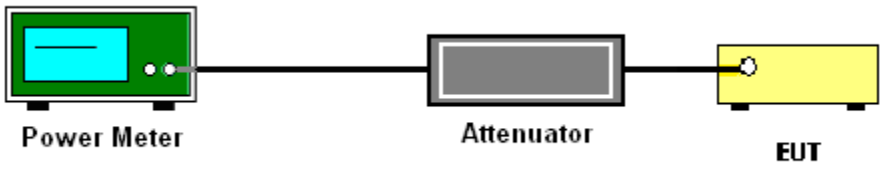
3.2.3 Test Procedures

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 4	Temperature :	24~25℃
Test Engineer :	Issac Song	Relative Humidity :	49~51%

Mod.	Data Rate	NTX	Channel	Freq. (MHz)	Duty Factor (dB)		Average Conducted Power (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		Pass /Fail
					Chain Port 0	Chain Port 1	Chain Port 0	Chain Port 1	SUM	Chain Port 0	Chain Port 1	Chain Port 0	Chain Port 1	
11a	6Mbps	1	149	5745	0.29	0.29	11.51	10.54	-	30.00	30.00	1.70	2.85	Pass
11a	6Mbps	1	157	5785	0.29	0.29	11.10	9.94		30.00	30.00	1.70	2.85	Pass
11a	6Mbps	1	165	5825	0.29	0.29	11.03	9.54		30.00	30.00	1.70	2.85	Pass
HT20	MCS0	1	149	5745	0.32	0.31	11.45	10.43		30.00	30.00	1.70	2.85	Pass
HT20	MCS0	1	157	5785	0.32	0.31	10.81	10.19		30.00	30.00	1.70	2.85	Pass
HT20	MCS0	1	165	5825	0.32	0.31	10.79	9.85		30.00	30.00	1.70	2.85	Pass
HT40	MCS0	1	151	5755	0.60	0.61	8.95	8.52		30.00	30.00	1.70	2.85	Pass
HT40	MCS0	1	159	5795	0.60	0.61	8.65	8.92		30.00	30.00	1.70	2.85	Pass
HT20	MCS0	2	149	5745	0.31	0.31	11.62	10.43	14.08	30.00		5.30		Pass
HT20	MCS0	2	157	5785	0.31	0.31	11.20	10.26	13.77	30.00		5.30		Pass
HT20	MCS0	2	165	5825	0.31	0.31	11.12	9.96	13.59	30.00		5.30		Pass
HT40	MCS0	2	151	5755	0.60	0.65	8.80	8.36	11.60	30.00		5.30		Pass
HT40	MCS0	2	159	5795	0.60	0.65	8.71	8.27	11.51	30.00		5.30		Pass

3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

<FCC 14-30 CFR 15.407>

For the band 5.725–5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz 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).

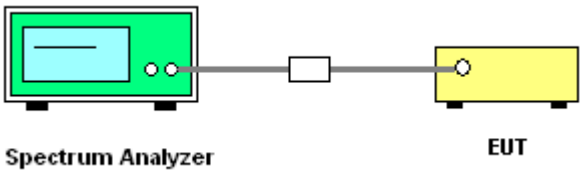
1. The testing follows Method SA-2 of FCC KDB 789033 D01 General UNII Test Procedures v01r03.
   - Measure the duty cycle.
   - Set span to encompass the entire emission bandwidth (EBW) of the signal.
   - Set RBW = 300 kHz.
   - Set VBW ≥ 1 MHz.
   - Number of points in sweep ≥ 2 Span / RBW.
   - Sweep time = auto.
   - Detector = RMS
   - Trace average at least 100 traces in power averaging mode.
   - Add 10 log(500kHz/RBW) to the test result.
   - 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.
4. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

Method (1): Measure and sum the spectra across the outputs.

The total final Power Spectral Density is from a device with 2 transmitter outputs. The spectrum measurements of the individual outputs are all performed with the same span and number of points, the spectrum value in the first spectral bin of output 1 is summed with that in the first spectral bin of output 2 to obtain the value for the first frequency bin of the summed spectrum.

3.3.4 Test Setup

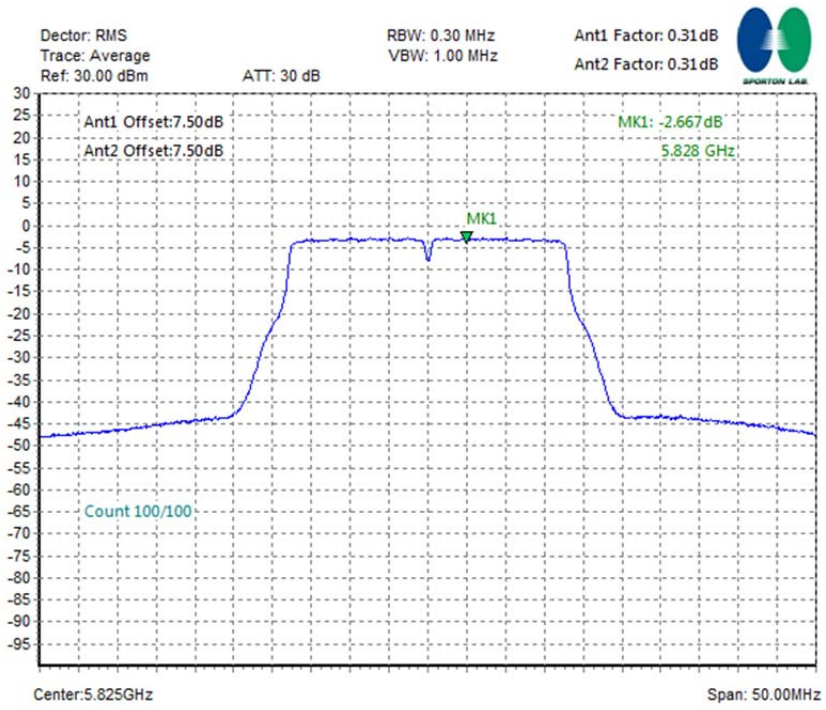


3.3.5 Test Result of Power Spectral Density

Test Band :	5GHz band 4	Temperature :	24~25℃
Test Engineer :	Issac Song	Relative Humidity :	49~51%

Mod.	Data Rate	NTX	Channel	Freq. (MHz)	Duty Factor (dB)		10log (500kHz /RBW) Factor (dB)		Average Power Density (dBm/500kHz)			Average PSD Limit (dBm/500kHz)		DG (dBi)		Pass /Fail
					Chain Port 0	Chain Port 1	Chain Port 0	Chain Port 1	Chain Port 0	Chain Port 1	SUM	Chain Port 0	Chain Port 1	Chain Port 0	Chain Port 1	
11a	6Mbps	1	149	5745	0.29	0.29	2.22	2.22	-2.55	-	-	30.00	30.00	1.70	2.85	Pass
11a	6Mbps	1	157	5785	0.29	0.29	2.22	2.22	-1.41	-		30.00	30.00	1.70	2.85	Pass
11a	6Mbps	1	165	5825	0.29	0.29	2.22	2.22	-1.65	-		30.00	30.00	1.70	2.85	Pass
HT20	MCS0	1	149	5745	0.32	0.31	2.22	2.22	-2.27	-		30.00	30.00	1.70	2.85	Pass
HT20	MCS0	1	157	5785	0.32	0.31	2.22	2.22	-1.84	-		30.00	30.00	1.70	2.85	Pass
HT20	MCS0	1	165	5825	0.32	0.31	2.22	2.22	-2.27	-		30.00	30.00	1.70	2.85	Pass
HT40	MCS0	1	151	5755	0.60	0.61	2.22	2.22	-7.23	-		30.00	30.00	1.70	2.85	Pass
HT40	MCS0	1	159	5795	0.60	0.61	2.22	2.22	-6.87	-		30.00	30.00	1.70	2.85	Pass
HT20	MCS0	2	149	5745	0.31	0.31	2.22		-		-0.61	30.00		5.30		Pass
HT20	MCS0	2	157	5785	0.31	0.31	2.22				-0.47	30.00		5.30		Pass
HT20	MCS0	2	165	5825	0.31	0.31	2.22				-0.45	30.00		5.30		Pass
HT40	MCS0	2	151	5755	0.60	0.65	2.22				-5.58	30.00		5.30		Pass
HT40	MCS0	2	159	5795	0.60	0.65	2.22				-5.72	30.00		5.30		Pass

Worst Case Power Density (dBm/300kHz)



3.4 Unwanted Emissions 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.

3.4.1 Limit of Unwanted Emissions

(1) For transmitters operating in the 5725-5850 MHz band: all emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an EIRP of -17 dBm/MHz (78.3dBμV/m); for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an EIRP of -27 dBm/MHz (68.3dBμV/m).

(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.

$$E=\frac{1000000\sqrt{30P}}{3}$$ μV/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.

3.4.2 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 ≥ 3 MHz
   - Detector = Peak
   - Sweep time = auto
   - Trace mode = max hold

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

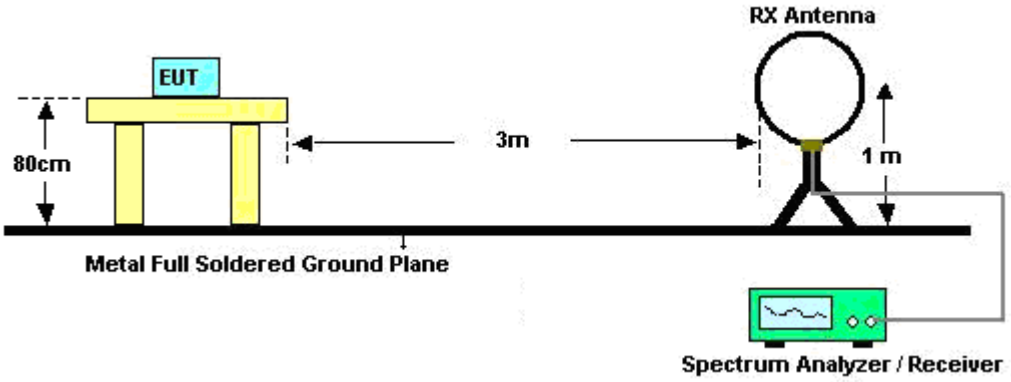
- RBW = 1 MHz
- VBW = 10 Hz, when duty cycle is no less than 98 percent.
- VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

Chain Port	Band	Duty Cycle(%)	T(ms)	1/T(kHz)	VBW Setting
0	802.11a	93.464	1.430	0.699	1kHz
1	802.11a	93.464	1.430	0.699	1kHz
0+1	802.11n HT20	93.056	1.340	0.746	1kHz
0+1	802.11n HT40	87.080	0.674	1.484	3kHz

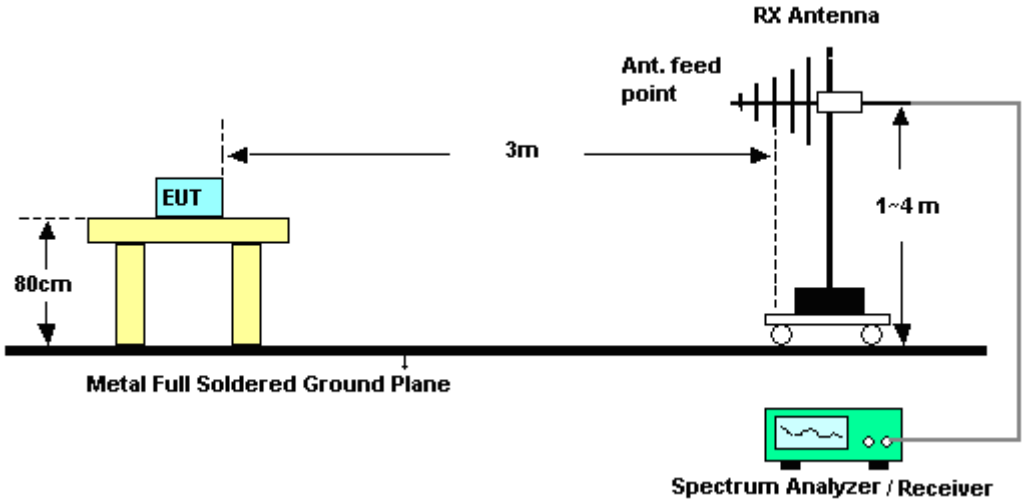
2. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
3. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
4. The antenna is a broadband 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

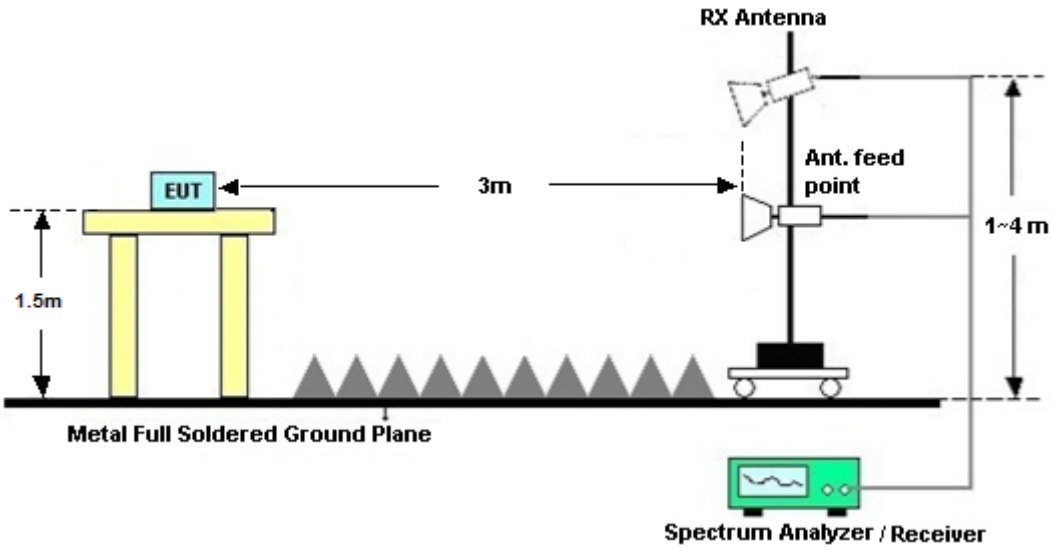
For radiated emissions below 30MHz



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 of Radiated Band Edges

Please refer to Appendix A.

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

Please refer to Appendix A.

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 (dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

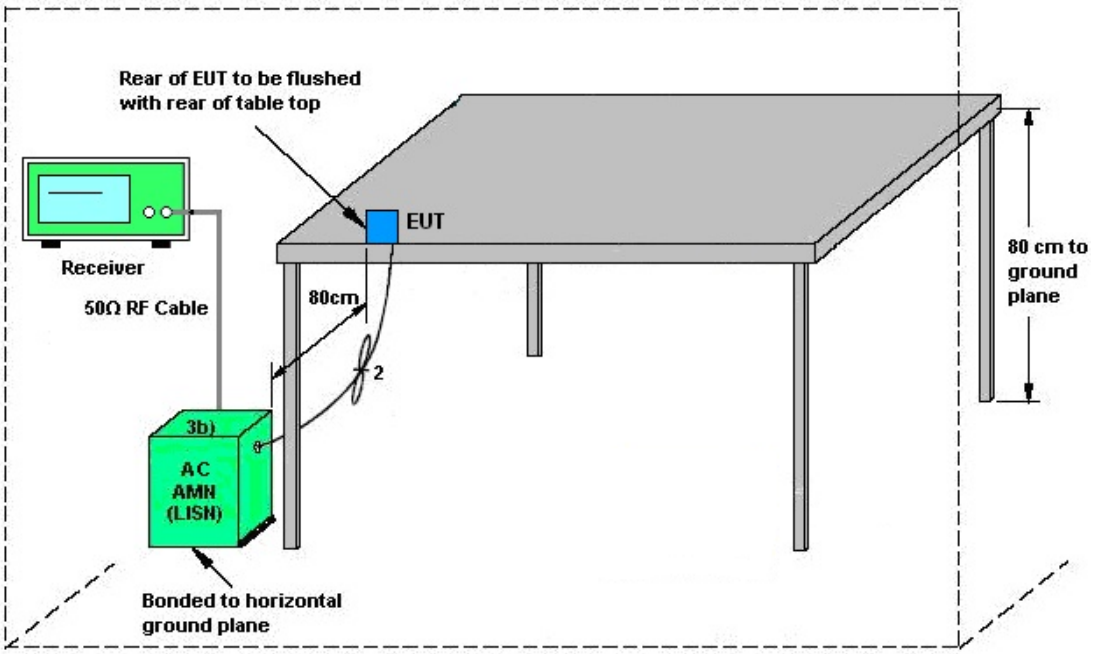
3.5.2 Measuring Instruments

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.

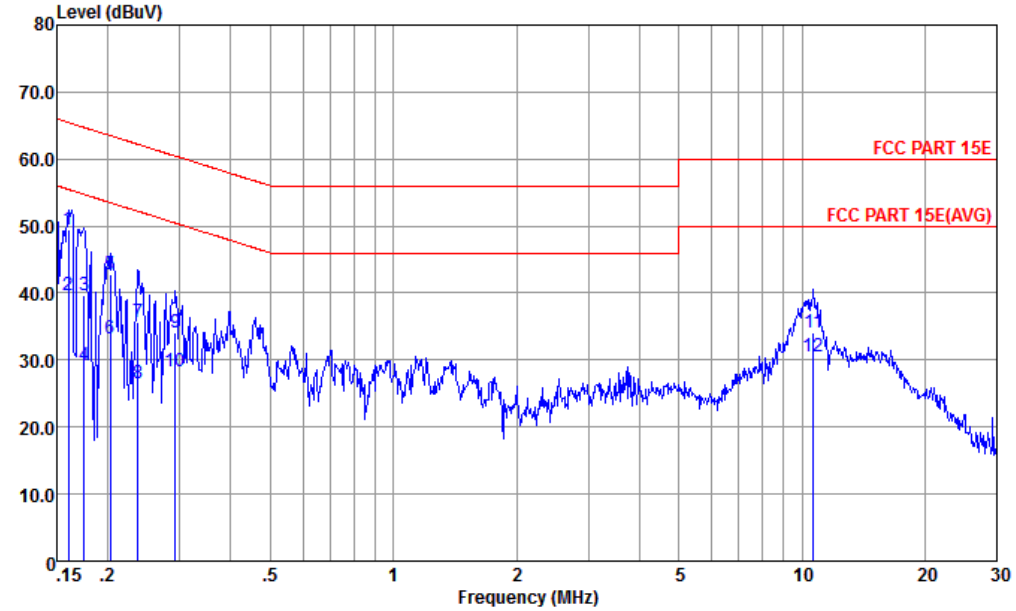
3.5.4 Test Setup



AMN = Artificial mains network (LISN)
AE = Associated equipment
EUT = Equipment under test
ISN = Impedance stabilization network

3.5.5 Test Result of AC Conducted Emission

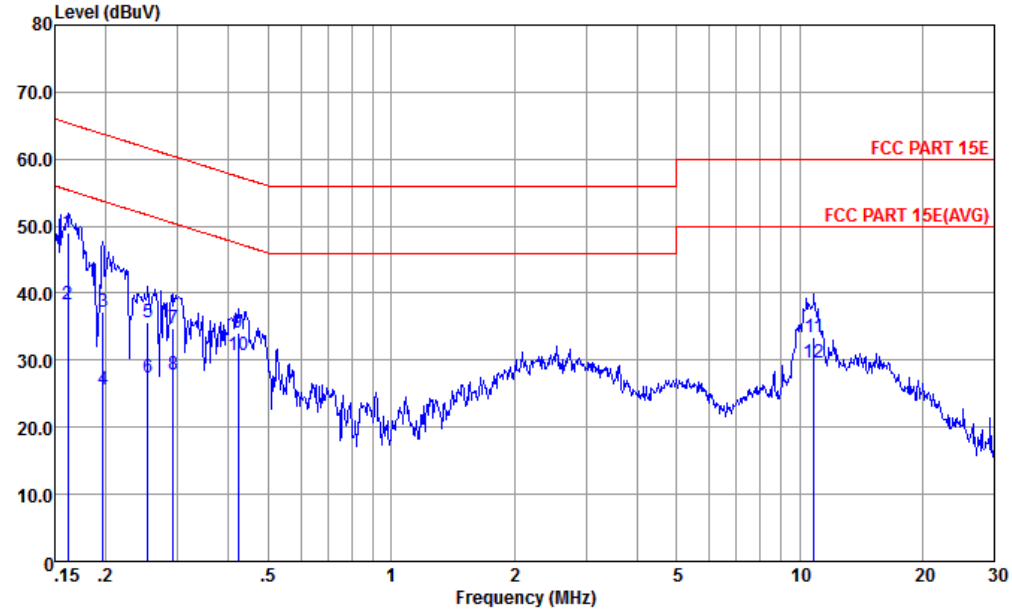
Test Mode :	Mode 1	Temperature :	22~24℃
Test Engineer :	Amos Zhang	Relative Humidity :	37~39%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	Bluetooth Link + WLAN (5G) Link + Earphone + Adapter		



Site : CO01-KS
Condition : FCC PART 15E LISN-L20140306 LINE

		Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
		MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1		0.16	49.38	-16.09	65.47	37.20	1.79	10.39	QP
2	*	0.16	39.68	-15.79	55.47	27.50	1.79	10.39	Average
3		0.17	39.66	-25.06	64.72	27.80	1.42	10.44	QP
4		0.17	29.26	-25.46	54.72	17.40	1.42	10.44	Average
5		0.20	42.69	-20.80	63.49	31.20	0.99	10.50	QP
6		0.20	33.09	-20.40	53.49	21.60	0.99	10.50	Average
7		0.24	35.63	-26.59	62.22	24.20	0.91	10.52	QP
8		0.24	26.53	-25.69	52.22	15.10	0.91	10.52	Average
9		0.29	34.20	-26.26	60.46	22.90	0.73	10.57	QP
10		0.29	28.20	-22.26	50.46	16.90	0.73	10.57	Average
11		10.68	34.06	-25.94	60.00	22.90	0.20	10.96	QP
12		10.68	30.46	-19.54	50.00	19.30	0.20	10.96	Average

Test Mode :	Mode 1	Temperature :	22~24℃
Test Engineer :	Amos Zhang	Relative Humidity :	37~39%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	Bluetooth Link + WLAN (5G) Link + Earphone + Adapter		



Site : CO01-KS
Condition : FCC PART 15E LISN-N20140306 NEUTRAL

		Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
		MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	*	0.16	49.01	-16.37	65.38	36.90	1.71	10.40	QP
2		0.16	38.31	-17.07	55.38	26.20	1.71	10.40	Average
3		0.20	37.13	-26.63	63.76	25.61	1.03	10.49	QP
4		0.20	25.73	-28.03	53.76	14.21	1.03	10.49	Average
5		0.25	35.61	-26.03	61.64	24.20	0.88	10.53	QP
6		0.25	27.31	-24.33	51.64	15.90	0.88	10.53	Average
7		0.29	34.83	-25.63	60.46	23.50	0.76	10.57	QP
8		0.29	27.93	-22.53	50.46	16.60	0.76	10.57	Average
9		0.42	34.10	-23.32	57.42	23.11	0.37	10.62	QP
10		0.42	30.70	-16.72	47.42	19.71	0.37	10.62	Average
11		10.85	33.48	-26.52	60.00	22.31	0.21	10.96	QP
12		10.85	29.68	-20.32	50.00	18.51	0.21	10.96	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 4	Test Engineer :	Issac Song

Mod.	Data Rate	N_{TX}	Channel	Freq. (MHz)	Center Frequency (MHz)	Frequency Deviation (MHz)	Frequency Stability (ppm)	Temperature (°C)	Voltage (V)
11a	6Mbps	1	149	5745	5745.000	0.000	0.00	20	3.5
11a	6Mbps	1	149	5745	5745.000	0.000	0.00	20	4.2
11a	6Mbps	1	149	5745	5745.000	0.000	0.00	20	3.8
11a	6Mbps	1	149	5745	5745.000	0.000	0.00	-30	3.8
11a	6Mbps	1	149	5745	5745.000	0.000	0.00	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

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

For CDD transmissions, directional gain is calculated as

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

where

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

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

N_{ANT} = the total number of antennas

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

G_k is the gain in dBi of the kth antenna.

The EUT supports CDD mode.

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

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

	Chain Port 0 (dBi)	Chain Port 1 (dBi)	DG for Power (dBi)	DG for PSD (dBi)	Power Limit Reduction (dB)	PSD Limit Reduction (dB)
Band IV	1.70	2.85	5.30	5.30	0.00	0.00

Power Limit Reduction = DG(Power) – 6dBi, (min = 0)

PSD Limit Reduction = DG(PSD) – 6dBi, (min = 0)

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSP40	100319	9kHz~40GHz	Oct. 28, 2014	Oct. 29, 2014	Oct. 27, 2015	Conducted (TH01-KS)
Pulse Power Senor	Anritsu	MA2411B	0917070	30MHz~40GHz	Feb. 27, 2014	Oct. 29, 2014	Feb. 26, 2015	Conducted (TH01-KS)
Power Meter	Anritsu	ML2495A	1005002	50MHz Bandwidth	Feb. 27, 2014	Oct. 29, 2014	Feb. 26, 2015	Conducted (TH01-KS)
Thermal Chamber	Ten Billion	TTC-B3S	TBN-960502	-40~+150°C	Oct. 25, 2014	Oct. 29, 2014	Oct. 24, 2015	Conducted (TH01-KS)
EMI Test Receiver	R&S	ESR7	101403	9kHz~7GHz; Max 30dBm	Sep. 29, 2014	May 04, 2015	Sep. 28, 2015	Radiation (03CH02-KS)
Spectrum Analyzer	R&S	FSV40	101040	10kHz~40GHz; Max 30dBm	Sep. 25, 2014	May 04, 2015	Sep. 24, 2015	Radiation (03CH02-KS)
Loop Antenna	R&S	HFH2-Z2	100321	9kHz~30MHz	Nov. 13, 2014	May 04, 2015	Nov. 12, 2015	Radiation (03CH01-KS)
Bilog Antenna	TeseQ	CBL6112D	37879	30MHz~2GHz	Sep. 13, 2014	May 04, 2015	Sep. 12, 2015	Radiation (03CH02-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	75957	1GHz~18GHz	Nov. 08, 2014	May 04, 2015	Nov. 07, 2015	Radiation (03CH02-KS)
Active Horn Antenna	com-power	AHA-118	701030	1GHz~18GHz	Nov. 08, 2014	May 04, 2015	Nov. 07, 2015	Radiation (03CH02-KS)
SHF-EHF Horn	com-power	AH-840	101070	18GHz~40GHz	Sep. 04, 2014	May 04, 2015	Sep. 03, 2015	Radiation (03CH02-KS)
Amplifier	com-power	PA-103A	161069	1kHz~1000MHz / 32 dB	May 04, 2015	May 04, 2015	May 03, 2016	Radiation (03CH02-KS)
Amplifier	Agilent	8449B	3008A02384	1GHz~26.5GHz Gain 30dB	Oct. 28, 2014	May 04, 2015	Oct. 27, 2015	Radiation (03CH02-KS)
AC Power Source	Chroma	61601	616010002473	N/A	NCR	May 04, 2015	NCR	Radiation (03CH02-KS)
Turn Table	MF	MF7802	N/A	0~360 degree	NCR	May 04, 2015	NCR	Radiation (03CH02-KS)
Antenna Mast	MF	MF7802	N/A	1 m~4 m	NCR	May 04, 2015	NCR	Radiation (03CH02-KS)
EMI Receiver	R&S	ESCI7	100768	9kHz~7GHz;	May 04, 2014	Apr. 24, 2015	May 03, 2015	Conduction (CO01-KS)
AC LISN	MessTec	AN3016	060103	9kHz~30MHz	Oct. 25, 2014	Apr. 24, 201	Oct. 24, 2015	Conduction (CO01-KS)
AC LISN (for auxiliary equipment)	MessTec	AN3016	060105	9kHz~30MHz	Oct. 25, 2014	Apr. 24, 201	Oct. 24, 2015	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP000000811	AC 0V~300V, 45Hz~1000Hz	Oct. 25, 2014	Apr. 24, 201	Oct. 24, 2015	Conduction (CO01-KS)

5 Uncertainty of Evaluation

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

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

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**5.1 dB**

Appendix A. Radiated Spurious Emission

Band 4 - 5725~5850MHz

WIFI 802.11a (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
0		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11a CH 149 5745MHz		5700.92	56.9	-11.4	68.3	48.07	35.26	9.59	36.02	100	292	P	H
		5722.84	56.88	-21.42	78.3	48.12	35.28	9.63	36.15	100	292	P	H
	*	5744	93.73	-	-	85.09	35.29	9.63	36.28	100	292	P	H
	*	5738	83.38	-	-	74.74	35.29	9.63	36.28	100	292	A	H
		5714.84	59.43	-8.87	68.3	50.6	35.26	9.59	36.02	187	0	P	V
		5723.56	62.22	-16.08	78.3	53.46	35.28	9.63	36.15	187	0	P	V
	*	5744	106.23	-	-	97.59	35.29	9.63	36.28	187	0	P	V
	*	5738	96.14	-	-	87.5	35.29	9.63	36.28	187	0	A	V
802.11a CH 157 5785MHz	*	5784	94.19	-	-	85.74	35.32	9.66	36.53	103	278	P	H
	*	5786	83.88	-	-	75.54	35.34	9.66	36.66	103	278	A	H
	*	5784	106.66	-	-	98.21	35.32	9.66	36.53	194	3	P	V
	*	5778	96.32	-	-	87.87	35.32	9.66	36.53	194	3	A	V
802.11a CH 165 5825MHz		5857.36	56.36	-21.94	78.3	48.03	35.4	9.74	36.81	100	12	P	H
		5862.24	56.37	-11.93	68.3	48.04	35.4	9.74	36.81	100	12	P	H
	*	5824	93.54	-	-	85.21	35.37	9.7	36.74	100	12	P	H
	*	5818	83.03	-	-	74.68	35.35	9.7	36.7	100	12	A	H
		5858.24	57.82	-20.48	78.3	49.49	35.4	9.74	36.81	224	25	P	V
		5861.76	57.08	-11.22	68.3	48.75	35.4	9.74	36.81	224	25	P	V
	*	5828	103.65	-	-	95.32	35.37	9.7	36.74	224	25	P	V
	*	5818	93.82	-	-	85.47	35.35	9.7	36.7	224	25	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 4 5725~5850MHz

WIFI 802.11a (Harmonic @ 3m)

WIFI Ant. 0	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11a CH 149 5745MHz		11490	47.97	-26.03	74	55.17	39.19	14.15	60.54	169	58	P	H
		11490	50.15	-23.85	74	57.35	39.19	14.15	60.54	173	69	P	V
802.11a CH 157 5785MHz		11571	46.2	-27.8	74	53.33	39.26	14.11	60.5	176	325	P	H
		11568	49.56	-24.44	74	56.69	39.26	14.11	60.5	186	26	P	V
802.11a CH 165 5825MHz		11649	46.35	-27.65	74	53.44	39.31	14.07	60.47	159	223	P	H
		11649	49.52	-24.48	74	56.61	39.31	14.07	60.47	193	54	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 4 - 5725~5850MHz

WIFI 802.11a (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11a CH 149 5745MHz		5714.12	60.68	-7.62	68.3	51.85	35.26	9.59	36.02	248	214	P	H
		5723.08	62.98	-15.32	78.3	54.22	35.28	9.63	36.15	248	214	P	H
	*	5744	104.41	-	-	95.77	35.29	9.63	36.28	248	214	P	H
	*	5746	93.98	-	-	85.34	35.29	9.63	36.28	248	214	A	H
		5698.2	59.55	-8.75	68.3	50.6	35.25	9.59	35.89	109	271	P	V
		5723.56	62.65	-15.65	78.3	53.89	35.28	9.63	36.15	109	271	P	V
	*	5744	104.47	-	-	95.83	35.29	9.63	36.28	109	271	P	V
	*	5738	94.12	-	-	85.48	35.29	9.63	36.28	109	271	A	V
802.11a CH 157 5785MHz	*	5788	103.57	-	-	95.23	35.34	9.66	36.66	237	214	P	H
	*	5790	93.15	-	-	84.81	35.34	9.66	36.66	237	214	A	H
	*	5784	102.94	-	-	94.49	35.32	9.66	36.53	100	279	P	V
	*	5778	92.43	-	-	83.98	35.32	9.66	36.53	100	279	A	V
802.11a CH 165 5825MHz		5851.28	60.76	-17.54	78.3	52.41	35.38	9.74	36.77	216	198	P	H
		5872.4	58.32	-9.98	68.3	50.03	35.4	9.74	36.85	216	198	P	H
	*	5824	100.17	-	-	91.84	35.37	9.7	36.74	216	198	P	H
	*	5822	89.76	-	-	81.43	35.37	9.7	36.74	216	198	A	H
		5850.96	61.99	-16.31	78.3	53.64	35.38	9.74	36.77	134	277	P	V
		5871.76	57.99	-10.31	68.3	49.7	35.4	9.74	36.85	134	277	P	V
	*	5824	102.02	-	-	93.69	35.37	9.7	36.74	134	277	P	V
	*	5828	92.01	-	-	83.68	35.37	9.7	36.74	134	277	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 4 5725~5850MHz

WIFI 802.11a (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11a CH 149 5745MHz		11490	58.33	-15.67	74	65.53	39.19	14.15	60.54	151	13	P	H
		11490	43.75	-10.25	54	50.95	39.19	14.15	60.54	151	13	A	H
		11490	56.36	-17.64	74	63.56	39.19	14.15	60.54	186	224	P	V
		11490	42.73	-11.27	54	49.93	39.19	14.15	60.54	186	224	A	V
802.11a CH 157 5785MHz		11571	47.72	-26.28	74	54.85	39.26	14.11	60.5	168	74	P	H
		11570	53.98	-20.02	74	61.11	39.26	14.11	60.5	154	168	P	V
		11570	40.49	-13.51	54	47.62	39.26	14.11	60.5	154	168	A	V
802.11a CH 165 5825MHz		11649	47.59	-26.41	74	54.68	39.31	14.07	60.47	174	220	P	H
		11649	54.3	-19.7	74	61.39	39.31	14.07	60.47	152	24	P	V
		11649	40.32	-13.68	54	47.41	39.31	14.07	60.47	152	24	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 4 5725~5850MHz

WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI Ant. 0+1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		5713	59.01	-9.29	68.3	50.18	35.26	9.59	36.02	159	356	P	H
		5723.16	62.82	-15.48	78.3	54.06	35.28	9.63	36.15	159	356	P	H
802.11n	*	5754	106.56	-	-	98.02	35.31	9.63	36.4	159	356	P	H
HT20	*	5742	96.36	-	-	87.72	35.29	9.63	36.28	159	356	A	H
CH 149		5711.72	58.97	-9.33	68.3	50.14	35.26	9.59	36.02	168	111	P	V
5745MHz		5725	61.35	-16.95	78.3	52.59	35.28	9.63	36.15	168	111	P	V
	*	5750	102.22	-	-	93.58	35.29	9.63	36.28	168	111	P	V
	*	5752	91.85	-	-	83.31	35.31	9.63	36.4	168	111	A	V
802.11n	*	5788	106.67	-	-	98.33	35.34	9.66	36.66	214	0	P	H
HT20	*	5790	96.67	-	-	88.33	35.34	9.66	36.66	214	0	A	H
CH 157	*	5780	102.68	-	-	94.23	35.32	9.66	36.53	150	104	P	V
5785MHz	*	5788	90.7	-	-	82.36	35.34	9.66	36.66	150	104	A	V
		5851.12	59.65	-18.65	78.3	51.3	35.38	9.74	36.77	150	0	P	H
		5874.8	57.72	-10.58	68.3	49.39	35.4	9.78	36.85	150	0	P	H
802.11n	*	5830	105.76	-	-	97.43	35.37	9.7	36.74	150	0	P	H
HT20	*	5828	95.75	-	-	87.42	35.37	9.7	36.74	150	0	A	H
CH 165		5850.4	61.79	-16.51	78.3	53.44	35.38	9.74	36.77	150	110	P	V
5825MHz		5864.96	57.36	-10.94	68.3	49.03	35.4	9.74	36.81	150	110	P	V
	*	5832	101.42	-	-	93.09	35.37	9.7	36.74	150	110	P	V
	*	5830	91.14	-	-	82.81	35.37	9.7	36.74	150	110	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 4 5725~5850MHz

WIFI 802.11n HT20 (Harmonic @ 3m)

WIFI Ant. 0+1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 149 5745MHz		11490	47.64	-26.36	74	54.84	39.19	14.15	60.54	150	120	P	H
		11490	49.99	-24.01	74	57.19	39.19	14.15	60.54	150	154	P	V
802.11n HT20 CH 157 5785MHz		11562	50.07	-23.93	74	57.23	39.24	14.11	60.51	150	214	P	H
		11574	49.01	-24.99	74	56.14	39.26	14.11	60.5	150	360	P	V
802.11n HT20 CH 165 5825MHz		11649	47.74	-26.26	74	54.83	39.31	14.07	60.47	154	210	P	H
		11649	47.95	-26.05	74	55.04	39.31	14.07	60.47	150	0	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 4 5725~5850MHz

WIFI 802.11n HT40 (Band Edge @ 3m)

WIFI Ant. 0+1	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
	!	5714.68	64.69	-3.61	68.3	55.86	35.26	9.59	36.02	212	91	P	H
		5722.76	67.4	-10.9	78.3	58.64	35.28	9.63	36.15	212	91	P	H
802.11n	*	5764	101.28	-	-	92.71	35.31	9.66	36.4	212	91	P	H
HT40	*	5760	90.44	-	-	81.87	35.31	9.66	36.4	212	91	A	H
CH 151	!	5712.68	64.24	-4.06	68.3	55.41	35.26	9.59	36.02	150	360	P	V
5755MHz		5720.28	63.82	-14.48	78.3	55.06	35.28	9.63	36.15	150	360	P	V
	*	5748	102.3	-	-	93.66	35.29	9.63	36.28	150	360	P	V
	*	5760	92.97	-	-	84.4	35.31	9.66	36.4	150	360	A	V
		5850.48	57.65	-20.65	78.3	49.3	35.38	9.74	36.77	203	89	P	H
		5866.24	57.44	-10.86	68.3	49.11	35.4	9.74	36.81	203	89	P	H
802.11n	*	5798	101.21	-	-	92.83	35.34	9.7	36.66	203	89	P	H
HT40	*	5802	90.67	-	-	82.29	35.34	9.7	36.66	203	89	A	H
CH 159		5857.2	56.84	-21.46	78.3	48.51	35.4	9.74	36.81	150	0	P	V
5795MHz		5870.32	57.28	-11.02	68.3	48.95	35.4	9.74	36.81	150	0	P	V
	*	5800	102.39	-	-	94.01	35.34	9.7	36.66	150	0	P	V
	*	5800	92.13	-	-	83.75	35.34	9.7	36.66	150	0	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 4 5725~5850MHz

WIFI 802.11n HT40 (Harmonic @ 3m)

WIFI Ant. 0+1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT40 CH 151 5755MHz		11510	45.36	-28.64	74	52.55	39.2	14.15	60.54	150	78	P	H
		11511	47.11	-26.89	74	54.3	39.2	14.15	60.54	150	354	P	V
802.11n HT40 CH 159 5795MHz		11589	46.12	-27.88	74	53.23	39.27	14.11	60.49	150	0	P	H
		11589	47.94	-26.06	74	55.05	39.27	14.11	60.49	150	246	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Emission below 1GHz

5GHz WIFI 802.11n HT40 (LF @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
0+1		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
5GHz 802.11n HT40 LF		32.91	31.35	-8.65	40	45.47	17.73	0.79	32.64	-	-	P	H
		53.28	32.88	-7.12	40	56.78	7.92	0.79	32.61	-	-	P	H
	!	65.89	36.07	-3.93	40	60.52	7.36	0.79	32.6	186	224	P	H
		110.51	29.8	-13.7	43.5	49.83	11.38	1.23	32.64	-	-	P	H
		148.34	29.28	-14.22	43.5	48.72	11.68	1.44	32.56	-	-	P	H
		195.87	33.13	-10.37	43.5	54.04	9.95	1.61	32.47	-	-	P	H
		32.91	33.21	-6.79	40	47.33	17.73	0.79	32.64	-	-	P	V
	!	53.28	35.43	-4.57	40	59.33	7.92	0.79	32.61	-	-	P	V
	!	67.83	35.78	-4.22	40	59.84	7.78	0.79	32.63	156	34	QP	V
		127.97	30.63	-12.87	43.5	50.49	11.52	1.23	32.61	-	-	P	V
		144.46	32.09	-11.41	43.5	51.77	11.65	1.23	32.56	-	-	P	V
		192.96	34.75	-8.75	43.5	55.55	10.06	1.61	32.47	-	-	P	V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												

Note symbol

*	**Fundamental Frequency** which can be ignored. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency.
!	Test result is **over limit** line.
P/A	**P**eak or **A**verage
H/V	**H**orizontal or **V**ertical

A calculation example for radiated spurious emission is shown as below:

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b CH 01 2412MHz		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H

1. Level(dBμV/m) =

Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

2. Over Limit(dB) = Level(dBμV/m) – Limit Line(dBμV/m)

For Peak Limit @ 2390MHz:

1. Level(dBμV/m)

= Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

= 32.22(dB/m) + 4.58(dB) + 54.51(dBμV) – 35.86 (dB)

= 55.45 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 55.45(dBμV/m) – 74(dBμV/m)

= -18.55(dB)

For Average Limit @ 2390MHz:

1. Level(dBμV/m)

= Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

= 32.22(dB/m) + 4.58(dB) + 42.6(dBμV) – 35.86 (dB)

= 43.54 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 43.54(dBμV/m) – 54(dBμV/m)

= -10.46(dB)

Both peak and average measured complies with the limit line, so test result is "PASS".