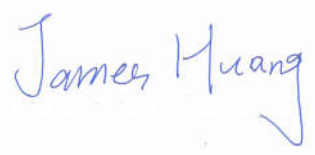
FCC RF Test Report

APPLICANT	:	ZTE CORPORATION
EQUIPMENT	:	WCDMA/LTE Multi-Mode Digital Mobile Phone
BRAND NAME	:	ZTE
MODEL NAME	:	Z962BL
FCC ID	:	SRQ-Z962BL
STANDARD	:	FCC Part 15 Subpart E §15.407
CLASSIFICATION	:	(NII) Unlicensed National Information Infrastructure

The product was received on Oct. 22, 2015 and testing was completed on Nov. 03, 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.



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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR5O2205E	Rev. 01	Initial issue of report	Dec. 04, 2015

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.403(i)	6dB, 26dB and 99% Occupied 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 3.72 dB at 5714.440 MHz
3.5	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 10.43 dB at 0.890 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	WCDMA/LTE Multi-Mode Digital Mobile Phone
Brand Name	ZTE
Model Name	Z962BL
FCC ID	SRQ-Z962BL
EUT supports Radios application	GSM/GPRS/EGPRS/WCDMA/HSPA/HSPA+(16QAM uplink is not supported)/LTE WLAN2.4GHz 802.11b/g/n HT20 WLAN5GHz 802.11a/n HT20 WLAN5GHz 802.11ac VHT20/VHT40/VHT80 Bluetooth v2.1+EDR/Bluetooth v4.1 LE
IMEI Code	Conducted: 868661020002150 Radiation: 868661020001368 Conduction: 868661020002184
HW Version	Z962BLHWV1.0
SW Version	Z962BLV1.0.0B02
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 Channel Frequency Range	5745 MHz ~ 5825 MHz
Maximum Output Power	802.11a : 13.39 dBm / 0.0218 W 802.11n HT20 : 10.22 dBm / 0.0105 W 802.11ac VHT20: 10.31 dBm / 0.0107 W 802.11ac VHT40: 9.77 dBm / 0.0095 W 802.11ac VHT80: 9.91 dBm / 0.0098 W
99% Occupied Bandwidth	802.11a : 19.181 MHz 802.11n HT20 : 19.431 MHz 802.11ac VHT20 : 19.331 MHz 802.11ac VHT40 : 36.963 MHz 802.11ac VHT80 : 75.125 MHz
Type of Modulation	802.11a/n : OFDM (BPSK / QPSK / 16QAM / 64QAM) 802.11ac : OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM)
Antenna Type / Gain	IFA Antenna with gain 0.30 dBi

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	03CH03-KS	CO01-KS	306251

Note: The test site complies with ANSI C63.4 2009 requirement.

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 C63.10-2009

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)
5745 ~ 5825 MHz Band 4 (U-NII-3)	149	5745	157	5785
	151	**5755**	**159**	**5795**
	153	5765	161	5805
	155	5775	165	5825

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 Output Power (dBm)										
Power vs. Channel			Power vs. Data Rate							
Channel	Frequency (MHz)	Data Rate 6Mbps	Channel	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
CH 149	5745	**13.39**	CH 149	13.29	13.37	13.09	13.07	13.06	12.97	13.04
CH 157	5785	13.18								
CH 165	5825	13.27								

WLAN 5GHz 802.11n-HT20 Output Power (dBm)										
Power vs. Channel			Power vs. Data Rate							
Channel	Frequency (MHz)	MCS Index MCS0	Channel	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 149	5745	**10.22**	CH 149	10.16	10.07	10.01	10.06	10.03	10.08	10.04
CH 157	5785	10.17								
CH 165	5825	9.85								

WLAN 5GHz 802.11ac VHT20 Average Power (dBm)										
Power vs. Channel			Power vs. Data Rate							
Channel	Frequency (MHz)	MCS Index MCS0	Channel	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	MCS8
CH 149	5745	**10.31**	CH 149	10.22	10.16	10.19	10.13	10.28	10.20	10.17	10.11
CH 157	5785	10.26									
CH 165	5825	10.20									

WLAN 5GHz 802.11ac VHT40 Average Power (dBm)											
Power vs. Channel			Power vs. Data Rate								
Channel	Frequency (MHz)	MCS Index MCS0	Channel	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	MCS8	MCS9
CH 151	5755	**9.77**	CH 151	9.69	9.60	9.56	9.64	9.61	9.63	9.68	9.66	9.67
CH 159	5795	9.50										

WLAN 5GHz 802.11n-HT80 Average Power (dBm)											
Power vs. Channel			Power vs. Data Rate								
Channel	Frequency (MHz)	MCS Index MCS0	Channel	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	MCS8	MCS9
CH 155	5775	**9.91**	CH 155	9.72	9.82	9.76	9.70	9.86	9.81	9.85	9.79	9.88

2.3 Test Mode

Final test mode of conducted test items and radiated spurious emissions are considering the modulation and worse data rates from the power table described in section 2.2.

Modulation	Data Rate
802.11a	6 Mbps
802.11n HT20	MCS0
802.11ac VHT20	MCS0
802.11ac VHT40	MCS0
802.11ac VHT80	MCS0

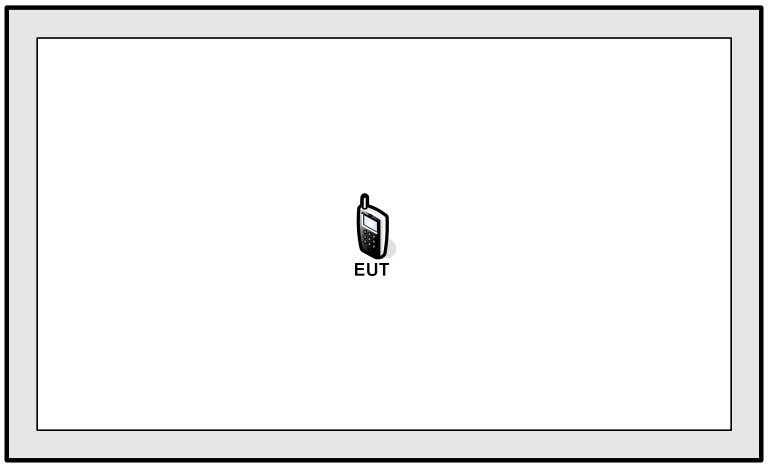
AC Conducted Emission	Mode 1 : GSM850 Idle + Bluetooth Link + WLAN (5GHz) Link + Earphone + USB Cable (Charging from Adapter)
Remark: For Radiated TCs, the tests were performed with adapter, earphone and USB cable.	

Ch. #		Band IV：5745 ~ 5825 MHz	
		802.11a	802.11n HT20
L	Low	149	149
M	Middle	157	157
H	High	165	165

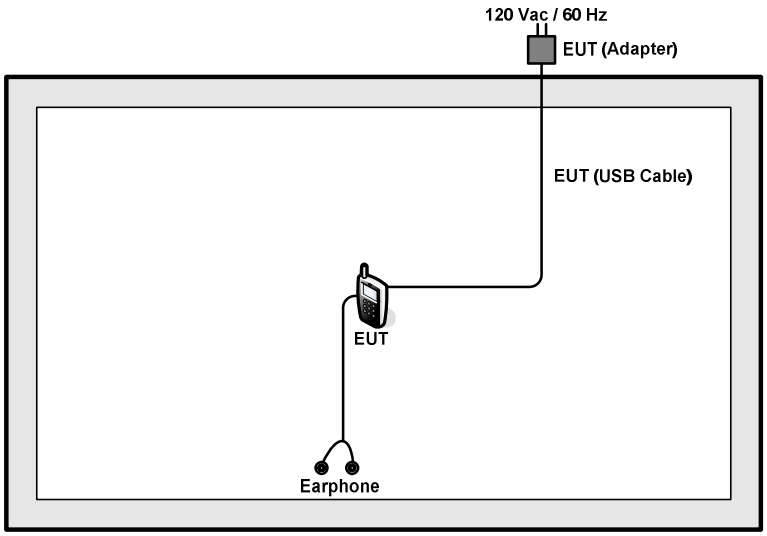
Ch. #		Band IV：5745 ~ 5825 MHz		
		802.11ac VHT20	802.11ac VHT40	802.11ac VHT80
L	Low	149	151	-
M	Middle	157	-	155
H	High	165	159	-

2.4 Connection Diagram of Test System

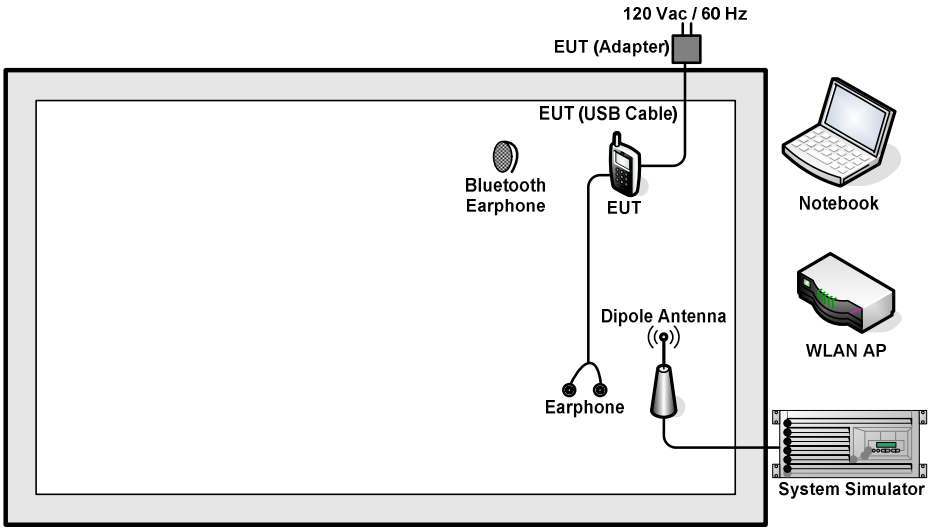
<WLAN5GHz 802.11a/WLAN5GHz 802.11ac VHT80 Tx Mode>



<WLAN5GHz 802.11n HT20/WLAN5GHz 802.11ac VHT20/VHT40 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.	System Simulator	R&S	CMU 200	N/A	N/A	Unshielded, 1.8 m
3.	Notebook	Lenovo	G480	N/A	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
4.	Bluetooth Earphone	Nokia	BH-102	PYAHS-107W	N/A	N/A
5.	Earphone	Lenovo	LH102	N/A	Unshielded, 1.2 m	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 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 7.0 dB.

Offset (dB) = RF cable loss(dB).
= 7.0 (dB)

3 Test Result

3.1 6dB and 26dB and 99% Occupied Bandwidth Measurement

3.1.1 Description of 6dB and 26dB and 99% Occupied Bandwidth

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

26dB and 99% Occupied bandwidth are reporting only.

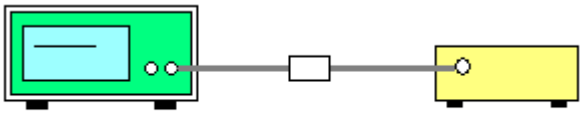
3.1.2 Measuring Instruments

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.

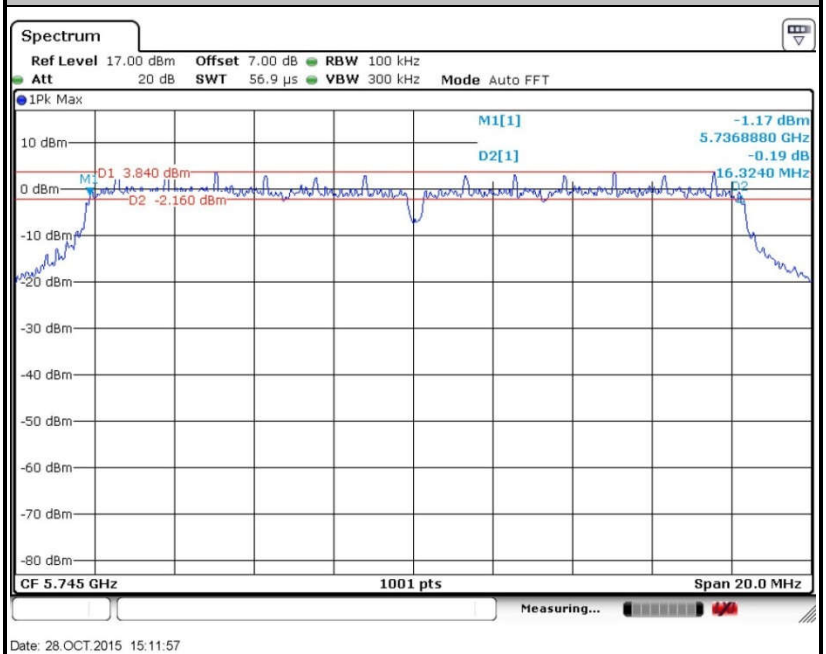
3.1.4 Test Setup



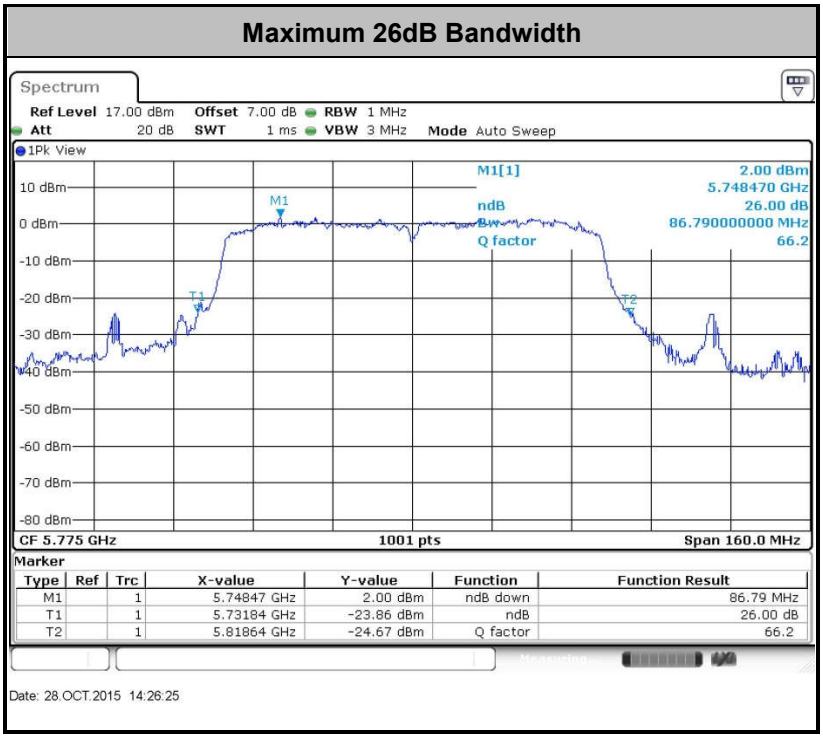
3.1.5 Test Result of 6dB Bandwidth

Please refer to Appendix A.

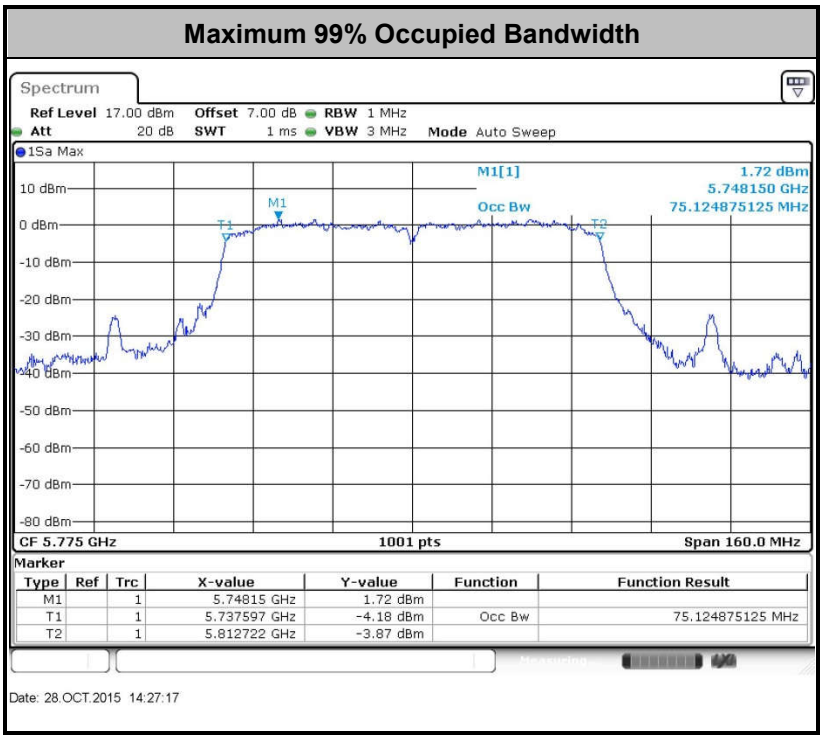
Minimum 6dB Bandwidth



Maximum 26dB Bandwidth



Maximum 99% Occupied 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

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.

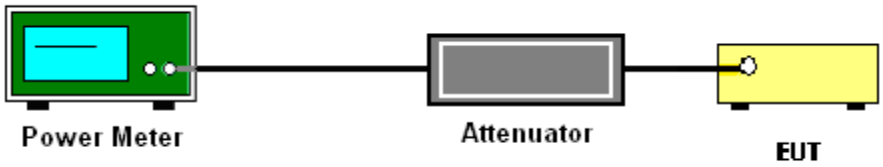
3.2.3 Test Procedures

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

Please refer to Appendix A.

3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

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.

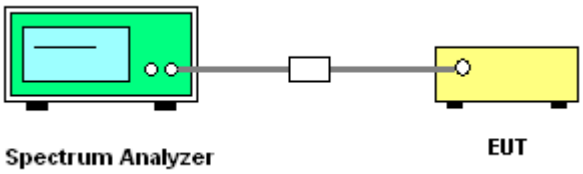
 # Method SA-2 #

(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.

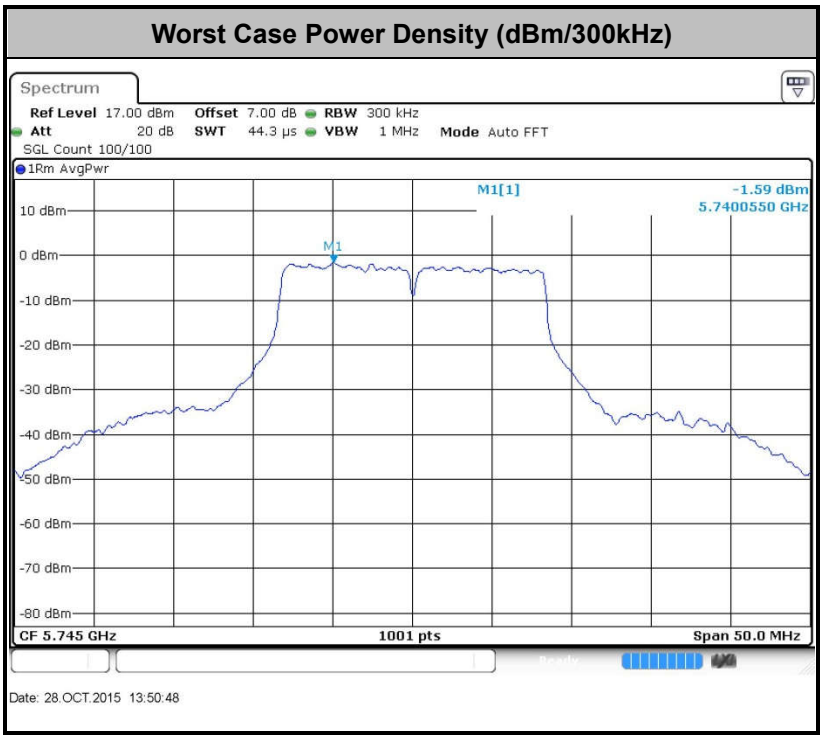
3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.

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) KDB 789033 D02 General UNII Test Procedures New Rules 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 ≥ 3 MHz
   - Detector = Peak
   - Sweep time = auto
   - Trace mode = max hold

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

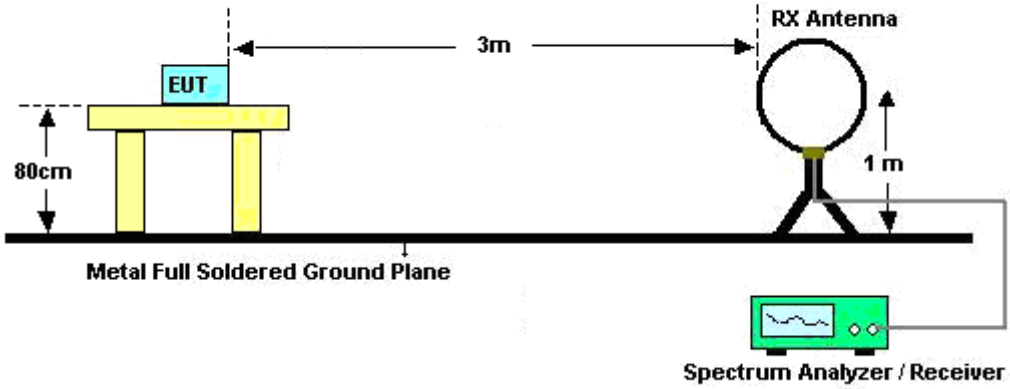
   - RBW = 1 MHz
   - VBW = 10 Hz, when duty cycle is no less than 98 percent.
   - VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

Band	Duty Cycle (%)	T(ms)	1/T(kHz)	VBW Setting
802.11a	87.037	1.362	0.734	1kHz
802.11n HT20	86.615	1.275	0.784	1kHz
802.11n VHT20	83.107	0.977	1.024	3kHz
802.11n VHT40	71.009	0.490	2.041	3kHz
802.11n VHT80	55.484	0.249	4.012	10kHz

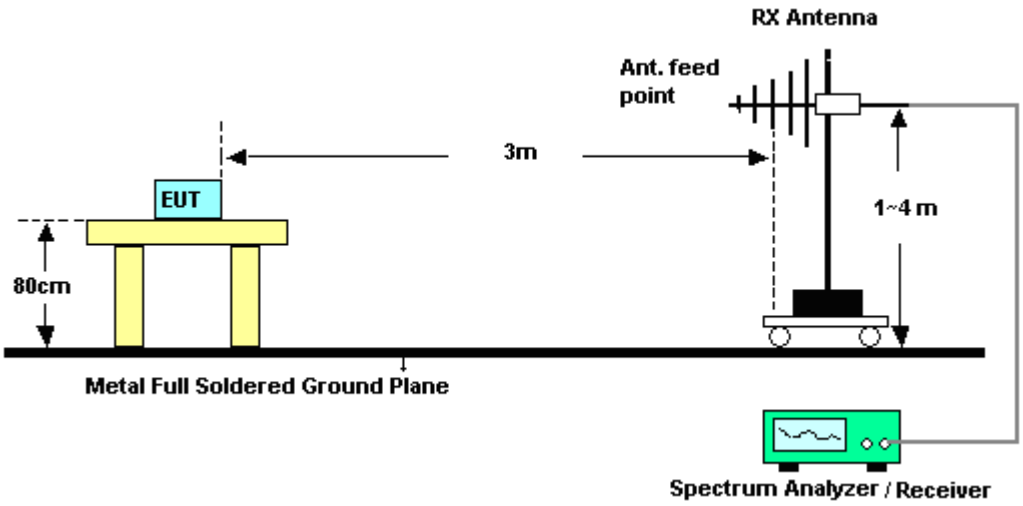
2. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
3. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
4. The antenna is a broadband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

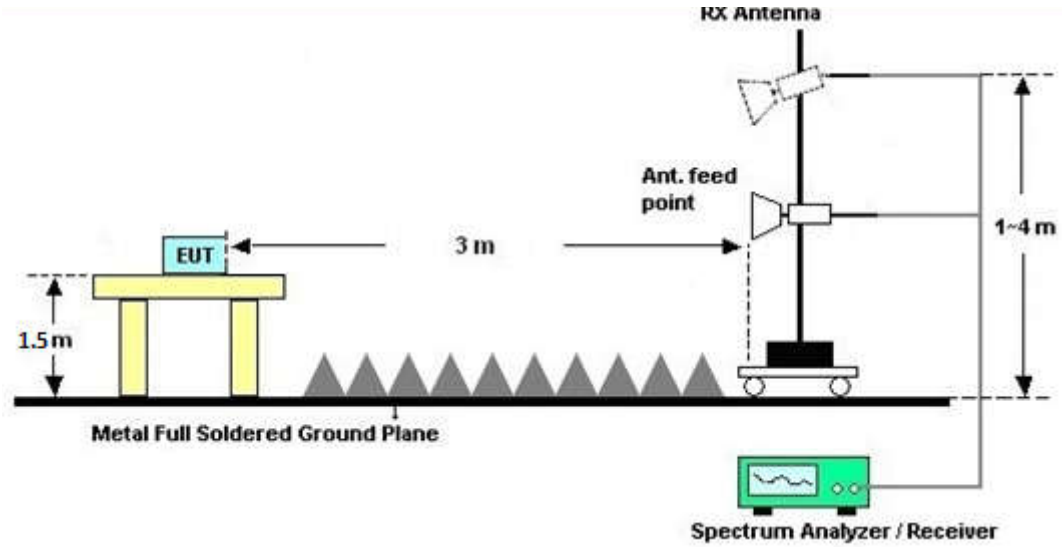
For radiated emissions below 30MHz



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 B.

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

Please refer to Appendix B.

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.

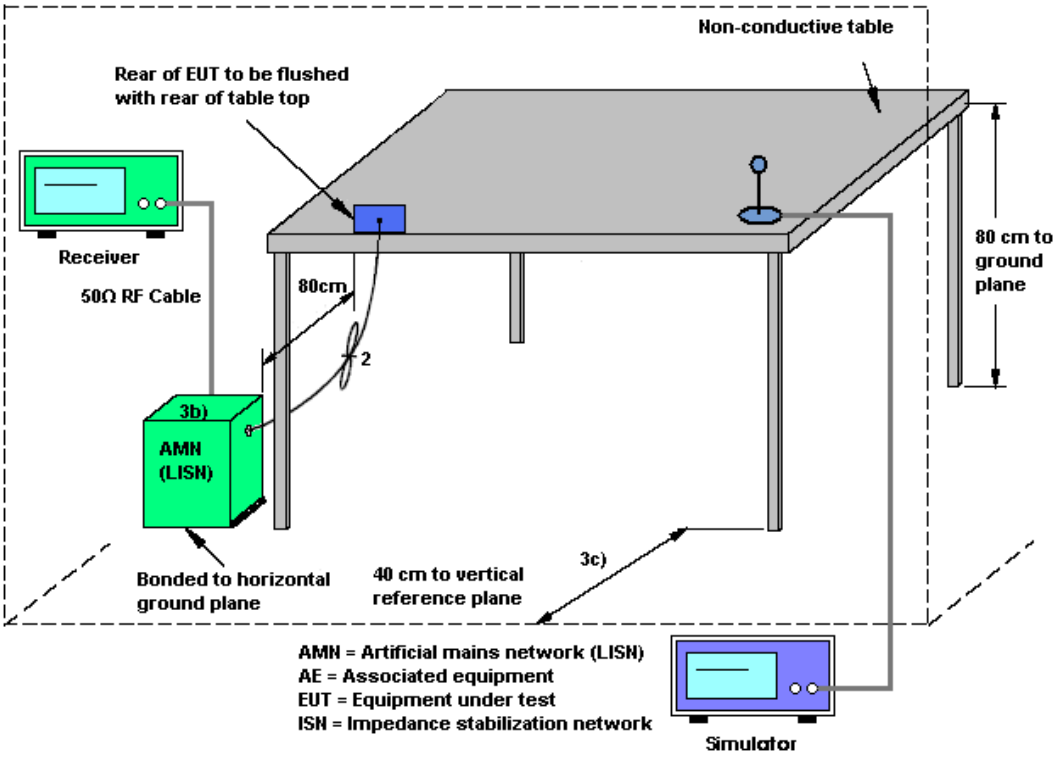
3.5.2 Measuring Instruments

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

3.5.3 Test Procedures

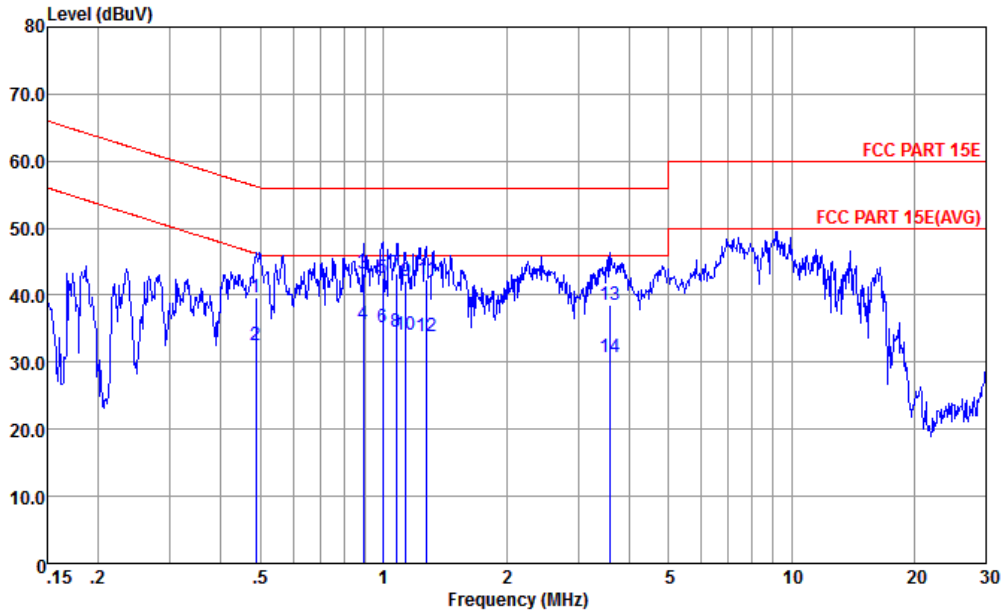
1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
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



3.5.5 Test Result of AC Conducted Emission

Test Mode :	Mode 1	**Temperature :**	22~24℃
Test Engineer :	Amos Zhang	**Relative Humidity :**	43~45%
Test Voltage :	120Vac / 60Hz	**Phase :**	Line
Function Type :	GSM850 Idle + Bluetooth Link + WLAN (5GHz) Link + Earphone + USB Cable (Charging from Adapter)		

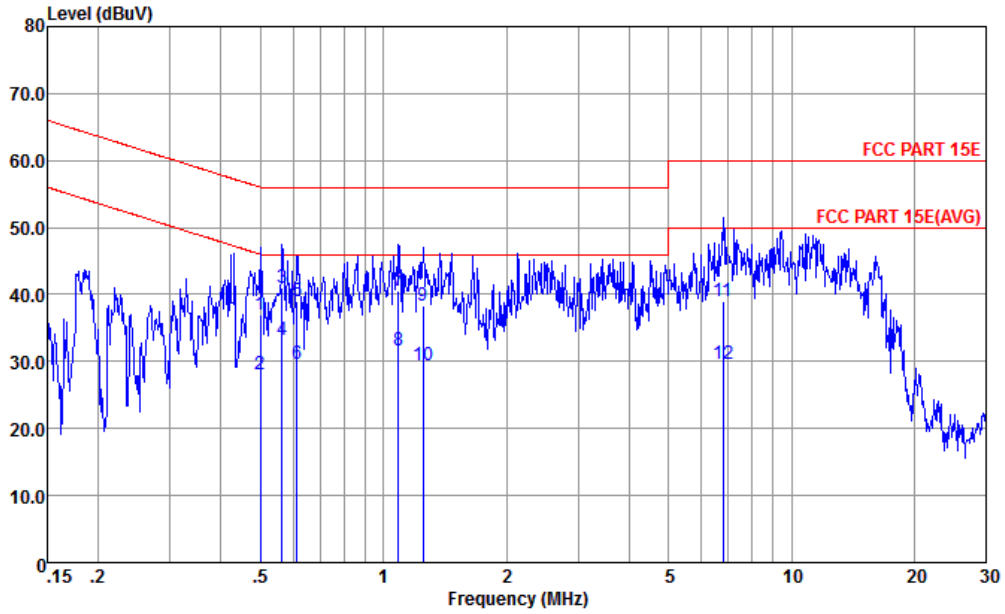


Site : CO01-KS
Condition : FCC PART 15E LISN-L20141025 LINE

mode : Mode 1

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.49	39.78	-16.45	56.23	29.41	0.21	10.16	QP
2	0.49	32.48	-13.75	46.23	22.11	0.21	10.16	Average
3	0.89	43.17	-12.83	56.00	32.91	0.12	10.14	QP
4 *	0.89	35.57	-10.43	46.00	25.31	0.12	10.14	Average
5	0.99	42.54	-13.46	56.00	32.30	0.10	10.14	QP
6	0.99	35.14	-10.86	46.00	24.90	0.10	10.14	Average
7	1.08	43.14	-12.86	56.00	32.90	0.10	10.14	QP
8	1.08	34.54	-11.46	46.00	24.30	0.10	10.14	Average
9	1.14	42.14	-13.86	56.00	31.90	0.10	10.14	QP
10	1.14	34.14	-11.86	46.00	23.90	0.10	10.14	Average
11	1.28	42.44	-13.56	56.00	32.20	0.10	10.14	QP
12	1.28	33.84	-12.16	46.00	23.60	0.10	10.14	Average
13	3.60	38.63	-17.37	56.00	28.30	0.17	10.16	QP
14	3.60	30.83	-15.17	46.00	20.50	0.17	10.16	Average

Test Mode :	Mode 1	Temperature :	22~24℃
Test Engineer :	Amos Zhang	Relative Humidity :	43~45%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	GSM850 Idle + Bluetooth Link + WLAN (5GHz) Link + Earphone + USB Cable (Charging from Adapter)		



Site : CO01-KS
Condition : FCC PART 15E LISN-N20141025 NEUTRAL

mode : Mode 1

		Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
		MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1		0.50	37.06	-18.95	56.01	26.60	0.30	10.16	QP
2		0.50	28.16	-17.85	46.01	17.70	0.30	10.16	Average
3		0.56	41.03	-14.97	56.00	30.60	0.27	10.16	QP
4	*	0.56	33.23	-12.77	46.00	22.80	0.27	10.16	Average
5		0.61	38.89	-17.11	56.00	28.50	0.23	10.16	QP
6		0.61	29.59	-16.41	46.00	19.20	0.23	10.16	Average
7		1.09	40.64	-15.36	56.00	30.40	0.10	10.14	QP
8		1.09	31.54	-14.46	46.00	21.30	0.10	10.14	Average
9		1.25	38.34	-17.66	56.00	28.10	0.10	10.14	QP
10		1.25	29.44	-16.56	46.00	19.20	0.10	10.14	Average
11		6.81	39.01	-20.99	60.00	28.60	0.20	10.21	QP
12		6.81	29.61	-20.39	50.00	19.20	0.20	10.21	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

Please refer to Appendix A.

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 output power limit.

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV30	101338	9kHz~30GHz	May. 04, 2015	Oct. 28, 2015	May. 03, 2016	Conducted (TH01-KS)
Pulse Power Senor	Anritsu	MA2411B	0917070	30MHz~40GHz	Jan. 23, 2015	Oct. 28, 2015	Jan. 22, 2016	Conducted (TH01-KS)
Power Meter	Anritsu	ML2495A	1005002	50MHz Bandwidth	Jan. 23, 2015	Oct. 28, 2015	Jan. 22, 2016	Conducted (TH01-KS)
Thermal Chamber	Ten Billion	TTC-B3S	TBN-960502	-40~+150°C	Oct. 24, 2015	Oct. 28, 2015	Oct. 23, 2016	Conducted (TH01-KS)
EMI Test Receiver	R&S	ESCI	100534	9kHz~3GHz	Oct. 24, 2015	Oct. 31, 2015	Oct. 23, 2016	Radiation (03CH03-KS)
EXA Spectrum Analyzer	Keysight	N9010A	MY55150244	10Hz-44GHz	Jun. 05, 2015	Oct. 31, 2015	Jun. 04, 2016	Radiation (03CH03-KS)
Loop Antenna	R&S	HFH2-Z2	100321	9kHz~30MHz	Nov. 13, 2014	Oct. 31, 2015	Nov. 12, 2015	Radiation (03CH03-KS)
Bilog Antenna	TeseQ	CBL6112D	35406	25MHz-2GHz	Jun. 25, 2015	Oct. 31, 2015	Jun. 24, 2016	Radiation (03CH03-KS)
Horn Antenna	Schwarzbeck	BBHA9120 D	9120D-1356	1GHz~18GHz	Jun. 25, 2015	Oct. 31, 2015	Jun. 24, 2016	Radiation (03CH03-KS)
SHF-EHF Horn	Schwarzbeck	BBHA 9170	BBHA170249	15GHz ~40GHz	Mar. 03, 2015	Oct. 31, 2015	Mar. 02, 2016	Radiation (03CH03-KS)
Amplifier	Burgeon	BPA-530	102212	0.01MHz-3000MHz	Aug. 10, 2015	Oct. 31, 2015	Aug. 09, 2016	Radiation (03CH03-KS)
Amplifier	MITEQ	TTA1840-35-HG	1887435	18~40GHz	Aug. 27, 2015	Oct. 31, 2015	Aug. 26, 2016	Radiation (03CH03-KS)
high gain Amplifier	MITEQ	AMF-7D-00101800-30-10P	1889560	1GHz-18GHz	Aug. 10, 2015	Oct. 31, 2015	Aug. 09, 2016	Radiation (03CH03-KS)
Amplifier	Agilent	8449B	3008A02370	1GHz~26.5GHz	Oct. 24, 2015	Oct. 31, 2015	Oct. 23, 2016	Radiation (03CH03-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Oct. 31, 2015	NCR	Radiation (03CH03-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	Oct. 31, 2015	NCR	Radiation (03CH03-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	Oct. 31, 2015	NCR	Radiation (03CH03-KS)
EMI Receiver	R&S	ESCI7	100768	9kHz~7GHz;	May 04, 2015	Nov. 03, 2015	May 03, 2016	Conduction (CO01-KS)
AC LISN	MessTec	AN3016	060103	9kHz~30MHz	Oct. 24, 2015	Nov. 03, 2015	Oct. 23, 2016	Conduction (CO01-KS)
AC LISN (for auxiliary equipment)	MessTec	AN3016	060105	9kHz~30MHz	Oct. 24, 2015	Nov. 03, 2015	Oct. 23, 2016	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP000000811	AC 0V~300V, 45Hz~1000Hz	Oct. 24, 2015	Nov. 03, 2015	Oct. 23, 2016	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))	**2.3dB**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**4.5dB**

Appendix A. Conducted Test Results

Report Number : FR5O2205E

Test Engineer:	Issac Song	Temperature:	24~25	°C
Test Date:	2015/10/28	Relative Humidity:	49~51	%

TEST RESULTS DATA
6dB and 26dB EBW and 99% OBW

Band IV									
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	99% Bandwidth (MHz)	26 dB Bandwidth (MHz)	6 dB Bandwidth (MHz)	6dB Bandwidth min. Limit (MHz)	Pass/Fail
11a	6M bps	1	149	5745	19.181	25.475	16.324	0.5	Pass
11a	6Mbps	1	157	5785	18.981	23.926	16.324	0.5	Pass
11a	6Mbps	1	165	5825	18.981	23.526	16.324	0.5	Pass
HT20	MCS 0	1	149	5745	19.381	23.926	17.562	0.5	Pass
HT20	MCS 0	1	157	5785	19.381	23.976	17.562	0.5	Pass
HT20	MCS 0	1	165	5825	19.431	23.776	17.562	0.5	Pass
VHT20	MCS 0	1	149	5745	19.331	24.026	17.542	0.5	Pass
VHT20	MCS 0	1	157	5785	19.281	23.726	17.562	0.5	Pass
VHT20	MCS 0	1	165	5825	19.331	23.876	17.562	0.5	Pass
VHT40	MCS 0	1	151	5755	36.963	44.865	35.125	0.5	Pass
VHT40	MCS 0	1	159	5795	36.863	44.775	35.165	0.5	Pass
VHT80	MCS 0	1	155	5775	75.125	86.790	75.125	0.5	Pass

TEST RESULTS DATA
Average Power Table

Band IV										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)	FCC Conducted Power Limit (dBm)	DG (dBi)		Pass/Fail
11a	6M bps	1	149	5745	0.60	13.39	30.00	0.30		Pass
11a	6Mbps	1	157	5785	0.60	13.18	30.00	0.30		Pass
11a	6Mbps	1	165	5825	0.60	13.27	30.00	0.30		Pass
HT20	MCS 0	1	149	5745	0.62	10.22	30.00	0.30		Pass
HT20	MCS 0	1	157	5785	0.62	10.17	30.00	0.30		Pass
HT20	MCS 0	1	165	5825	0.62	9.85	30.00	0.30		Pass
VHT20	MCS 0	1	149	5745	0.80	10.31	30.00	0.30		Pass
VHT20	MCS 0	1	157	5785	0.80	10.26	30.00	0.30		Pass
VHT20	MCS 0	1	165	5825	0.80	10.20	30.00	0.30		Pass
VHT40	MCS 0	1	151	5755	1.49	9.77	30.00	0.30		Pass
VHT40	MCS 0	1	159	5795	1.49	9.50	30.00	0.30		Pass
VHT80	MCS 0	1	155	5775	2.56	9.91	30.00	0.30		Pass

TEST RESULTS DATA
Power Spectral Density

Band IV										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	10log (500kHz /RBW) Factor (dB)	Average Power Density (dBm/500kHz)	Average PSD Limit (dBm/500kHz)	DG (dBi)	Pass/Fail
11a	6M bps	1	149	5745	0.60	2.22	1.23	30.00	0.30	Pass
11a	6Mbps	1	157	5785	0.60	2.22	1.11	30.00	0.30	Pass
11a	6Mbps	1	165	5825	0.60	2.22	0.85	30.00	0.30	Pass
HT20	MCS 0	1	149	5745	0.62	2.22	-3.64	30.00	0.30	Pass
HT20	MCS 0	1	157	5785	0.62	2.22	-3.22	30.00	0.30	Pass
HT20	MCS 0	1	165	5825	0.62	2.22	-3.51	30.00	0.30	Pass
VHT20	MCS 0	1	149	5745	0.80	2.22	-3.49	30.00	0.30	Pass
VHT20	MCS 0	1	157	5785	0.80	2.22	-3.22	30.00	0.30	Pass
VHT20	MCS 0	1	165	5825	0.80	2.22	-3.56	30.00	0.30	Pass
VHT40	MCS 0	1	151	5755	1.49	2.22	-6.41	30.00	0.30	Pass
VHT40	MCS 0	1	159	5795	1.49	2.22	-6.66	30.00	0.30	Pass
VHT80	MCS 0	1	155	5775	2.56	2.22	-9.22	30.00	0.30	Pass

Report Number : FR5O2205E

TEST RESULTS DATA
Frequency Stability

Band IV										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Center Frequency (MHz)	Frequency Deviation (MHz)	Frequency Stablility (ppm)	Temperature (°C)	Voltage (V)	Note
11a	6M bps	1	149	5745	5745.050	0.050	8.70	20	3.6	
11a	6M bps	1	149	5745	5745.050	0.050	8.70	20	4.35	
11a	6M bps	1	149	5745	5745.050	0.050	8.70	20	3.8	
11a	6M bps	1	149	5745	5745.050	0.050	8.70	-30	3.8	
11a	6M bps	1	149	5745	5745.050	0.050	8.70	50	3.8	

Appendix B. Radiated Test Results

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	*	5752	98.52	-	-	94.18	32.05	8.59	36.3	300	96	P	H
	*	5750	91.06	-	-	86.72	32.05	8.58	36.29	300	96	A	H
		5711.88	51.74	-16.56	68.3	47.43	32.03	8.55	36.27	300	96	P	H
		5724.28	63.31	-14.99	78.3	58.98	32.04	8.57	36.28	300	96	P	H
	*	5750	103.57	-	-	99.23	32.05	8.58	36.29	100	309	P	V
	*	5750	97.19	-	-	92.85	32.05	8.58	36.29	100	309	A	V
		5713.96	56.74	-11.56	68.3	52.43	32.03	8.55	36.27	100	309	P	V
		5723.64	70.93	-7.37	78.3	66.6	32.04	8.57	36.28	100	309	P	V
802.11a CH 157 5785MHz	*	5782	95	-	-	90.65	32.06	8.6	36.31	300	247	P	H
	*	5790	85.81	-	-	81.44	32.07	8.62	36.32	300	247	A	H
	*	5790	104.59	-	-	100.22	32.07	8.62	36.32	100	25	P	V
	*	5790	96.58	-	-	92.21	32.07	8.62	36.32	100	25	A	V
802.11a CH 165 5825MHz	*	5818	95.58	-	-	91.2	32.08	8.63	36.33	100	305	P	H
	*	5830	88.26	-	-	83.89	32.08	8.64	36.35	100	305	A	H
		5850.8	52.12	-26.18	78.3	47.74	32.09	8.65	36.36	100	305	P	H
		5862.4	46.96	-21.34	68.3	42.57	32.1	8.66	36.37	100	305	P	H
	*	5820	104.3	-	-	99.93	32.08	8.64	36.35	100	29	P	V
	*	5820	96.71	-	-	92.34	32.08	8.64	36.35	100	29	A	V
		5850	57.94	-20.36	78.3	53.56	32.09	8.65	36.36	100	29	P	V
		5862.56	54.12	-14.18	68.3	49.73	32.1	8.66	36.37	100	29	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 (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	50.65	-23.35	74	36.74	38.59	12.35	37.03	300	21	P	H
		11490	49.55	-24.45	74	35.64	38.59	12.35	37.03	300	360	P	V
802.11a CH 157 5785MHz		11570	50.29	-23.71	74	36.15	38.75	12.4	37.01	300	221	P	H
		11570	50.15	-23.85	74	36.01	38.75	12.4	37.01	100	174	P	V
802.11a CH 165 5825MHz		11649	49.64	-24.36	74	35.28	38.9	12.45	36.99	300	360	P	H
		11649	49.72	-24.28	74	35.36	38.9	12.45	36.99	100	360	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 HT20 (Band Edge @ 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)
	*	5752	96.74	-	-	92.4	32.05	8.59	36.3	100	239	P	H
	*	5740	89.36	-	-	85.02	32.05	8.58	36.29	100	239	A	H
802.11n		5714.44	48.06	-20.24	68.3	43.75	32.03	8.55	36.27	100	239	P	H
HT20		5723.96	56.13	-22.17	78.3	51.8	32.04	8.57	36.28	100	239	P	H
CH 149	*	5750	100.08	-	-	95.74	32.05	8.58	36.29	100	299	P	V
5745MHz	*	5750	92.37	-	-	88.03	32.05	8.58	36.29	100	299	A	V
		5714.36	50.04	-18.26	68.3	45.73	32.03	8.55	36.27	100	299	P	V
		5724.76	58.39	-19.91	78.3	54.06	32.04	8.57	36.28	100	299	P	V
802.11n	*	5780	95.5	-	-	91.15	32.06	8.6	36.31	110	235	P	H
HT20	*	5792	88.52	-	-	84.15	32.07	8.62	36.32	110	235	A	H
CH 157	*	5792	100	-	-	95.63	32.07	8.62	36.32	100	297	P	V
5785MHz	*	5790	92.15	-	-	87.78	32.07	8.62	36.32	100	297	A	V
	*	5830	94.56	-	-	90.19	32.08	8.64	36.35	120	249	P	H
	*	5820	87.35	-	-	82.98	32.08	8.64	36.35	120	249	A	H
802.11n		5851.28	49.11	-29.19	78.3	44.73	32.09	8.65	36.36	120	249	P	H
HT20		5888.64	47.75	-20.55	68.3	43.36	32.11	8.68	36.4	120	249	P	H
CH 165	*	5828	98.78	-	-	94.41	32.08	8.64	36.35	100	296	P	V
5825MHz	*	5832	92.24	-	-	87.87	32.08	8.64	36.35	100	296	A	V
		5850.24	51.59	-26.71	78.3	47.21	32.09	8.65	36.36	100	296	P	V
		5876.64	49.69	-18.61	68.3	45.3	32.1	8.67	36.38	100	296	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 HT20 (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)
802.11n HT20 CH 149 5745MHz		11490	48.25	-25.75	74	34.34	38.59	12.35	37.03	152	241	P	H
		11490	48.57	-25.43	74	34.66	38.59	12.35	37.03	112	315	P	V
802.11n HT20 CH 157 5785MHz		11571	48.14	-25.86	74	34	38.75	12.4	37.01	100	247	P	H
		11571	47.54	-26.46	74	33.4	38.75	12.4	37.01	105	300	P	V
802.11n HT20 CH 165 5825MHz		11649	49.18	-24.82	74	34.82	38.9	12.45	36.99	123	237	P	H
		11649	48.02	-25.98	74	33.66	38.9	12.45	36.99	100	301	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 4 5725~5850MHz

WIFI 802.11ac VHT20 (Band Edge @ 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)
	*	5752	98.84	-	-	94.5	32.05	8.59	36.3	100	270	P	H
	*	5748	91.51	-	-	87.17	32.05	8.58	36.29	100	270	A	H
802.11ac		5714.92	49.11	-19.19	68.3	44.8	32.03	8.55	36.27	100	270	P	H
VHT20		5723.56	61.02	-17.28	78.3	56.69	32.04	8.57	36.28	100	270	P	H
CH 149	*	5752	95.1	-	-	90.76	32.05	8.59	36.3	100	236	P	V
5745MHz	*	5752	88.52	-	-	84.18	32.05	8.59	36.3	100	236	A	V
		5713.64	47.42	-20.88	68.3	43.11	32.03	8.55	36.27	100	236	P	V
		5722.92	58.56	-19.74	78.3	54.23	32.04	8.57	36.28	100	236	P	V
802.11ac	*	5792	97.67	-	-	93.3	32.07	8.62	36.32	100	254	P	H
VHT20	*	5792	91.14	-	-	86.77	32.07	8.62	36.32	100	254	A	H
CH 157	*	5778	97.75	-	-	93.4	32.06	8.6	36.31	100	231	P	V
5785MHz	*	5780	90.41	-	-	86.06	32.06	8.6	36.31	100	231	A	V
	*	5832	101.19	-	-	96.82	32.08	8.64	36.35	100	252	P	H
	*	5832	93.8	-	-	89.43	32.08	8.64	36.35	100	252	A	H
802.11ac		5855.84	52.72	-25.58	78.3	48.33	32.1	8.66	36.37	100	252	P	H
VHT20		5876.96	50.98	-17.32	68.3	46.59	32.1	8.67	36.38	100	252	P	H
CH 165	*	5822	96	-	-	91.63	32.08	8.64	36.35	100	227	P	V
5825MHz	*	5832	89.04	-	-	84.67	32.08	8.64	36.35	100	227	A	V
		5850.32	49.1	-29.2	78.3	44.72	32.09	8.65	36.36	100	227	P	V
		5877.6	47.29	-21.01	68.3	42.9	32.1	8.67	36.38	100	227	P	V

Remark

1. No other spurious found.
2. All results are PASS against Peak and Average limit line.

Band 4 5725~5850MHz

WIFI 802.11ac VHT20 (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)
802.11ac VHT20 CH 149 5745MHz		11490	48.25	-25.75	74	34.34	38.59	12.35	37.03	100	97	P	H
		11490	48.57	-25.43	74	34.66	38.59	12.35	37.03	108	259	P	V
802.11ac VHT20 CH 157 5785MHz		11571	48.14	-25.86	74	34	38.75	12.4	37.01	104	263	P	H
		11571	47.54	-26.46	74	33.4	38.75	12.4	37.01	102	349	P	V
802.11ac VHT20 CH 165 5825MHz		11649	49.18	-24.82	74	34.82	38.9	12.45	36.99	102	351	P	H
		11649	48.02	-25.98	74	33.66	38.9	12.45	36.99	110	284	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 4 5725~5850MHz

WIFI 802.11ac VHT40 (Band Edge @ 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)
	*	5768	101.13	-	-	96.79	32.05	8.59	36.3	100	258	P	H
	*	5766	92.38	-	-	88.04	32.05	8.59	36.3	100	258	A	H
802.11ac		5711.96	61.04	-7.26	68.3	56.73	32.03	8.55	36.27	100	258	P	H
VHT40		5724.28	64.34	-13.96	78.3	60.01	32.04	8.57	36.28	100	258	P	H
CH 151	*	5752	89.93	-	-	85.59	32.05	8.59	36.3	100	8	P	V
5755MHz	*	5766	82.37	-	-	78.03	32.05	8.59	36.3	100	8	A	V
		5711.96	49.96	-18.34	68.3	45.65	32.03	8.55	36.27	100	8	P	V
		5724.12	55.39	-22.91	78.3	51.06	32.04	8.57	36.28	100	8	P	V
	*	5806	99.24	-	-	94.86	32.08	8.63	36.33	111	260	P	H
	*	5806	91.98	-	-	87.6	32.08	8.63	36.33	111	260	A	H
802.11ac		5853.92	56.57	-21.73	78.3	52.18	32.1	8.66	36.37	111	260	P	H
VHT40		5872.72	47.89	-20.41	68.3	43.5	32.1	8.67	36.38	111	260	P	H
CH 159	*	5808	91.56	-	-	87.18	32.08	8.63	36.33	301	282	P	V
5795MHz	*	5806	84.02	-	-	79.64	32.08	8.63	36.33	301	282	A	V
		5855.84	48.33	-29.97	78.3	43.94	32.1	8.66	36.37	301	282	P	V
		5867.68	51.26	-17.04	68.3	46.87	32.1	8.66	36.37	301	282	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 4 5725~5850MHz

WIFI 802.11ac VHT40 (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)
802.11ac VHT40 CH 151 5755MHz		11511	50.86	-23.14	74	36.93	38.6	12.36	37.03	300	360	P	H
		11511	50.29	-23.71	74	36.36	38.6	12.36	37.03	100	0	P	V
802.11ac VHT40 CH 159 5795MHz		11589	49.71	-24.29	74	35.51	38.79	12.42	37.01	300	360	P	H
		11589	49.09	-24.91	74	34.89	38.79	12.42	37.01	100	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 802.11ac VHT80 (Band Edge @ 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)
802.11ac VHT80 CH 155 5775MHz	*	5800	93.91	-	-	89.54	32.07	8.62	36.32	100	272	P	H
	*	5798	86.87	-	-	82.5	32.07	8.62	36.32	100	272	A	H
	!	5714.44	64.58	-3.72	68.3	60.27	32.03	8.55	36.27	100	272	P	H
		5715.16	66.7	-11.6	78.3	62.39	32.03	8.55	36.27	100	272	P	H
		5859.68	54.32	-23.98	78.3	49.93	32.1	8.66	36.37	100	272	P	H
		5860.88	53.74	-14.56	68.3	49.35	32.1	8.66	36.37	100	272	P	H
	*	5768	88.28	-	-	83.94	32.05	8.59	36.3	300	67	P	V
	*	5772	80.71	-	-	76.36	32.06	8.6	36.31	300	67	A	V
		5713.64	51.15	-17.15	68.3	46.84	32.03	8.55	36.27	300	67	P	V
		5715.56	59.49	-18.81	78.3	55.18	32.03	8.55	36.27	300	67	P	V
		5850.24	50.32	-27.98	78.3	45.94	32.09	8.65	36.36	300	67	P	V
		5860.64	47.36	-20.94	68.3	42.97	32.1	8.66	36.37	300	67	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 4 5725~5850MHz

WIFI 802.11ac VHT80 (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)
802.11ac VHT80 CH 155 5775MHz		11550	49.88	-24.12	74	35.8	38.71	12.39	37.02	100	0	P	H
		11550	49.74	-24.26	74	35.66	38.71	12.39	37.02	100	360	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Emission below 1GHz

5GHz WIFI 802.11ac VHT80 (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.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
5GHz 802.11ac VHT80 LF		34.85	18.26	-21.74	40	30.55	17.9	0.71	30.9	-	-	P	H
		157.07	15.23	-28.27	43.5	30.74	13.37	1.52	30.4	-	-	P	H
		252.13	18.95	-27.05	46	34.43	13.27	1.75	30.5	-	-	P	H
		323.91	23.4	-22.6	46	36.41	15.33	2.21	30.55	-	-	P	H
		452.92	21.04	-24.96	46	31.43	17.45	2.65	30.49	-	-	P	H
		783.69	26.18	-19.82	46	31.72	21.41	3.55	30.5	151	217	P	H
		30.97	17.18	-22.82	40	29.12	18.46	0.66	31.06	-	-	P	V
		180.35	16.35	-27.15	43.5	33.2	11.92	1.63	30.4	-	-	P	V
		252.13	20.97	-25.03	46	36.45	13.27	1.75	30.5	-	-	P	V
		288.02	23.75	-22.25	46	37.71	14.5	2.04	30.5	-	-	P	V
		323.91	24.65	-21.35	46	37.66	15.33	2.21	30.55	-	-	P	V
		824.43	26.09	-19.91	46	30.9	21.99	3.65	30.45	224	237	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”.