



# FCC RF Test Report

**APPLICANT** : ZTE CORPORATION  
**EQUIPMENT** : WCDMA/ LTE Multi-Mode Digital Mobile Phone  
**BRAND NAME** : ZTE  
**MODEL NAME** : A1P  
**MARKETING NAME** : A1P  
**FCC ID** : SRQ-ZTEA1P  
**STANDARD** : FCC Part 15 Subpart E §15.407  
**CLASSIFICATION** : (NII) Unlicensed National Information Infrastructure

The product was received on May 04, 2015 and testing was completed on Jun. 19, 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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**SUMMARY OF TEST RESULT**

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	15.403(i)	RSS-247 Section 6	6dB Bandwidth	> 500kHz	Pass	-
3.2	15.407(a)	RSS-247 Section 6	Maximum Conducted Output Power	≤ 30 dBm	Pass	-
3.3	15.407(a)	RSS-247 Section 6	Power Spectral Density	≤ 30 dBm/500kHz	Pass	-
3.4	15.407(b)	RSS-247 Section 6	Unwanted Emissions	≤ -17, -27 dBm/MHz &15.209(a)	Pass	Under limit 2.54 dB at 5713.080 MHz
3.5	15.207	RSS-Gen 8.8	AC Conducted Emission	15.207(a)	Pass	Under limit 9.42 dB at 0.480 MHz
3.6	15.407(g)	-	Frequency Stability	Within Operation Band	Pass	-
3.7	15.407(c)	RSS-247 6.4(2)	Automatically Discontinue Transmission	Discontinue Transmission	Pass	-
3.8	15.203 & 15.407(a)	N/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	A1P
Marketing Name	A1P
FCC ID	SRQ-ZTEA1P
EUT supports Radios application	GSM/GPRS/EGPRS/WCDMA/HSPA/ HSPA+(Downlink Only)/DC-HSDPA/LTE/NFC WLAN 11a/b/g/n HT20/HT40 WLAN 11ac VHT20/VHT40/VHT80 Bluetooth v3.0 + EDR/Bluetooth v4.1 LE
IMEI Code	Conducted: 004401783420967/004401783420901 Radiation: 004401783421007/004401783421001 Conduction: 004401783420843/004401783420801
HW Version	wtqD
SW Version	A1PV1.0.0B08
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

Product Specification subjective to this standard	
<b>Tx/Rx Channel Frequency Range</b>	5725 MHz ~ 5850 MHz
<b>Maximum Output Power</b>	802.11a : 10.20 dBm / 0.0105 W 802.11n HT20 : 10.10 dBm / 0.0102 W 802.11n HT40 : 9.78 dBm / 0.0095 W 802.11ac VHT20: 8.71 dBm / 0.0074 W 802.11ac VHT40: 8.68 dBm / 0.0074 W 802.11ac VHT80: 8.00 dBm / 0.0063 W
<b>Antenna Type / Gain</b>	PIFA Antenna with gain 0.30 dBi
<b>Type of Modulation</b>	802.11a/n : OFDM (BPSK / QPSK / 16QAM / 64QAM) 802.11ac : OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM)

### 1.5 Modification of EUT

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



### 1.6 Testing Location

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

<b>Test Site</b>	SPORTON INTERNATIONAL (KUNSHAN) INC.		
<b>Test Site Location</b>	No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P. R. China TEL: +86-0512-5790-0158 FAX: +86-0512-5790-0958		
<b>Test Site No.</b>	<b>Sporton Site No.</b>		<b>FCC/IC Registration No.</b>
	03CH02-KS	CO01-KS	418269/4086E

**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 C63.10-2013

**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 (Y/Z plane) were recorded in this report.

The final configuration from all the combinations and the worst-case data rates were investigated by measuring the maximum power across all the data rates and modulation modes under section 2.2.

Based on the worst configuration found above, the RF power setting is set individually to meet FCC compliance limit for the final conducted and radiated tests shown in section 2.3.

### 2.1 Carrier Frequency and Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5725-5850 MHz Band 4 (U-NII-3)	149	5745	157	5785
	<b>151</b>	<b>5755</b>	<b>159</b>	<b>5795</b>
	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.

5GHz 802.11a RF Output Power (dBm)										
Power vs. Channel			Power vs. MCS Index							
Channel	Frequency (MHz)	MCS Index	Channel	9M bps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
		6Mbps								
CH 149	5745	10.20	CH 149	10.14	10.12	10.14	10.01	10.04	10.07	10.13
CH 157	5785	9.99								
CH 165	5825	9.50								

5GHz 802.11n HT20 RF Output Power (dBm)										
Power vs. Channel			Power vs. MCS Index							
Channel	Frequency (MHz)	MCS Index	Channel	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
		MCS0								
CH 149	5745	10.10	CH 149	10.01	10.02	9.95	10.04	10.00	10.01	9.99
CH 157	5785	9.73								
CH 165	5825	9.28								

5GHz 802.11n HT40 RF Output Power (dBm)										
Power vs. Channel			Power vs. MCS Index							
Channel	Frequency (MHz)	MCS Index	Channel	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
		MCS0								
CH 151	5755	9.78	CH 151	9.72	9.71	9.75	9.66	9.71	9.70	9.66
CH 159	5795	9.63								

5GHz 802.11ac VHT20 RF Output Power (dBm)											
Power vs. Channel			Power vs. MCS Index								
Channel	Frequency (MHz)	MCS Index	Channel	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	MCS8
		MCS0									
CH 149	5745	8.71	CH 149	8.49	8.63	8.44	8.53	8.65	8.58	8.59	8.59
CH 157	5785	8.13									
CH 165	5825	7.87									



5GHz 802.11ac VHT40 RF Output Power (dBm)												
Power vs. Channel			Power vs. MCS Index									
Channel	Frequency (MHz)	MCS Index MCS0	Channel	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	MCS8	MCS9
CH 151	5755	8.68	CH 151	8.66	8.66	8.58	8.65	8.66	8.56	8.55	8.62	8.60
CH 159	5795	8.49										

5GHz 802.11ac VHT80 RF Output Power (dBm)												
Power vs. Channel			Power vs. MCS Index									
Channel	Frequency (MHz)	MCS Index MCS0	Channel	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	MCS8	MCS9
CH 155	5775	8.00	CH 155	7.91	7.86	7.85	7.91	7.97	7.90	7.94	7.95	7.96



### 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
802.11n HT40	MCS0
802.11ac VHT20	MCS0
802.11ac VHT40	MCS0
802.11ac VHT80	MCS0

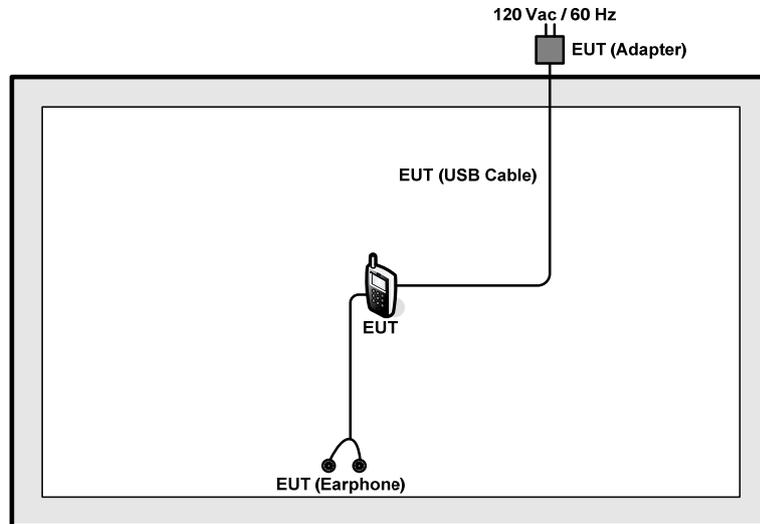
<b>AC Conducted Emission</b>	Mode 1 : GSM850 Idle + Bluetooth Link + WLAN (5GHz) Link + USB Cable (Charging from Adapter) + Earphone
<b>Remark:</b> For Radiated TCs, the tests were performed with adapter, USB cable and earphone.	

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

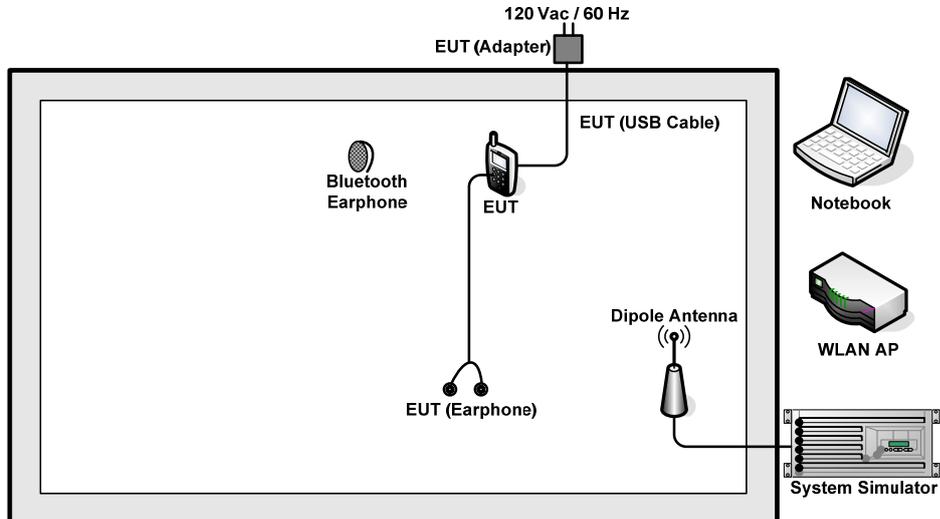
Ch. #		Band IV : 5725-5850 MHz		
		802.11ac VHT20	802.11ac VHT40	802.11ac VHT80
L	Low	149	151	-
M	Middle	157	-	155
H	High	165	159	-

## 2.4 Connection Diagram of Test System

### <WLAN Tx Mode>



### <AC Conducted Emission Mode>





## 2.5 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	System Simulator	R&S	CMU 200	N/A	N/A	Unshielded, 1.8 m
2.	WLAN AP	LINKSYS	WRT600N	Q87-WRT600NV11	N/A	Shielded, 1.8 m
3.	WLAN AP	D-Link	DIR-855	KA2DIR855A2	N/A	Unshielded, 1.8 m
4.	Notebook	Lenovo	G480	PRC4	N/A	AC I/P: Unshielded, 1.8 m DC O/P: Shielded, 1.8 m
5.	Bluetooth Earphone	Nokia	BH-102	PYAHS-107W	N/A	N/A
6.	DC Power Supply	GW INSTEK	GPD-2303S	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 continuously transmit/receive.

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



## 2.7 Measurement Results Explanation Example

For all conducted test items:

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

Example :

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

*Offset = RF cable loss + attenuator factor.*

Following shows an offset computation example with cable loss 6.5 dB and 10dB attenuator.

$$\begin{aligned} \text{Offset(dB)} &= \text{RF cable loss(dB)} + \text{attenuator factor(dB)}. \\ &= 6.5 + 10 = 16.5 \text{ (dB)} \end{aligned}$$

### 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.

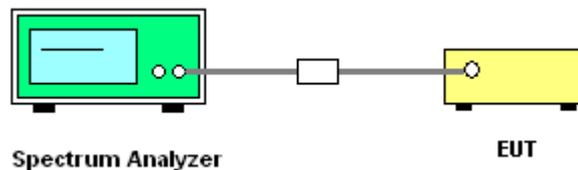
##### 3.1.2 Measuring Instruments

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  $\geq 3 \times$  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.

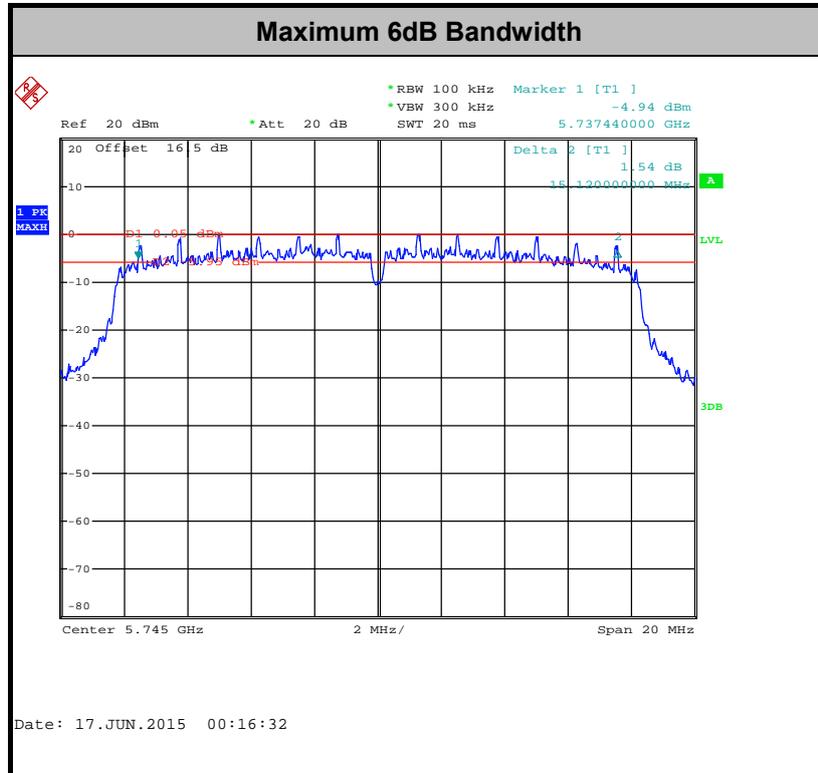
##### 3.1.4 Test Setup





### 3.1.5 Test Result of 6dB Bandwidth

Please refer to Appendix A.



**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.

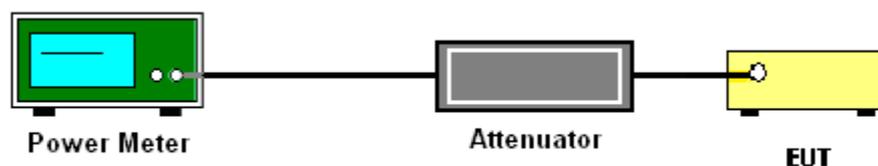
### 3.2.3 Test Procedures

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.

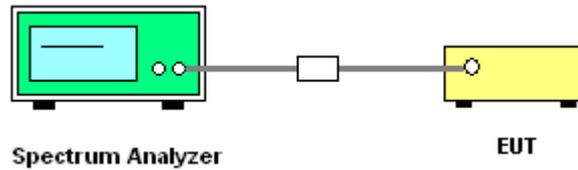
##### # Method SA-2 #

(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  $\geq$  1 MHz.
  - Number of points in sweep  $\geq$  2 Span / RBW.
  - Sweep time = auto.
  - Detector = RMS
  - Trace average at least 100 traces in power averaging mode.
  - Add  $10 \log(500\text{kHz}/\text{RBW})$  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.

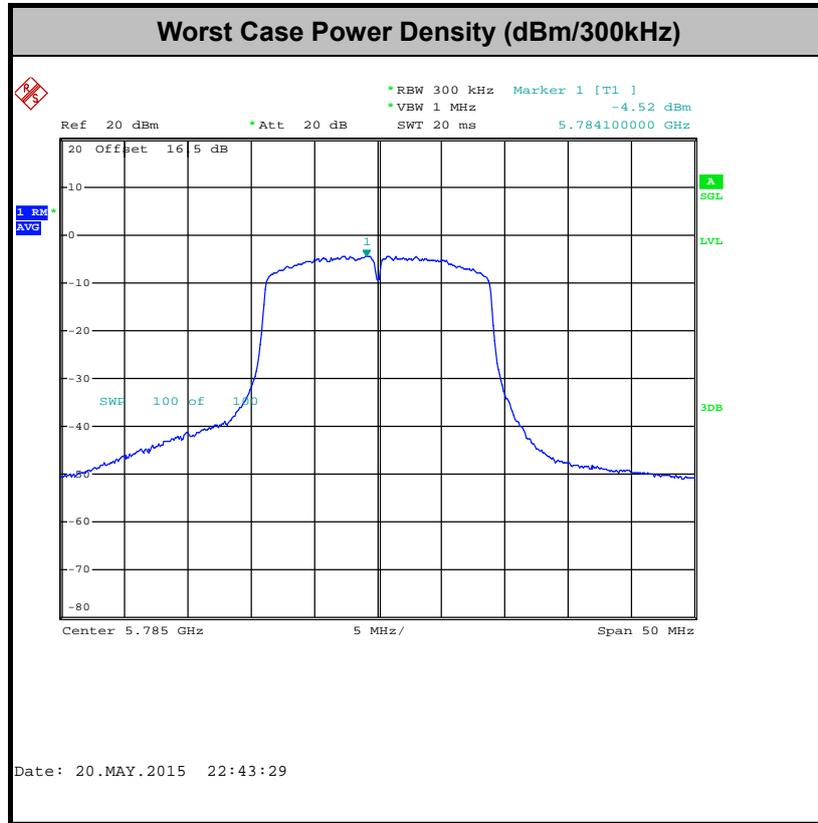
### 3.3.4 Test Setup





### 3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.





### 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.

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

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

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



### 3.4.2 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.
- $VBW \geq 1/T$ , when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

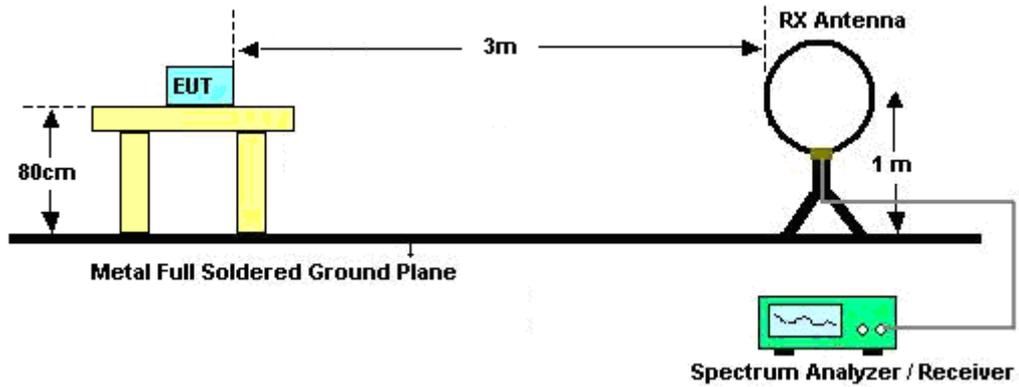
Band	Duty Cycle(%)	T(μs)	1/T(kHz)	VBW Setting
802.11a	94.47	2.05	0.49	1kHz
802.11n HT20	94.13	1.93	0.52	1kHz
802.11n HT40	89.43	0.95	1.05	3kHz
802.11n VHT20	94.23	1.93	0.52	1kHz
802.11n VHT40	88.93	0.95	1.05	3kHz
802.11n VHT80	82.14	0.46	2.17	3kHz



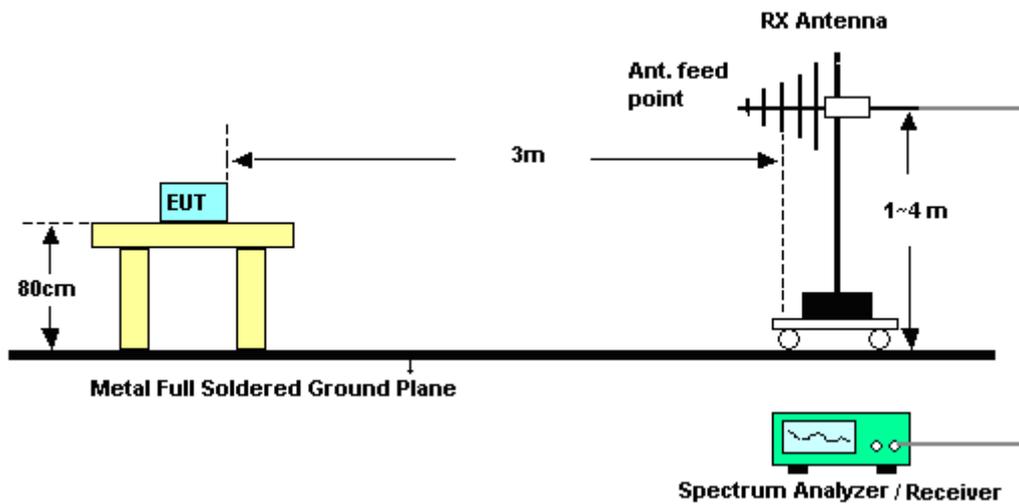
2. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
3. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
4. The antenna is a broadband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

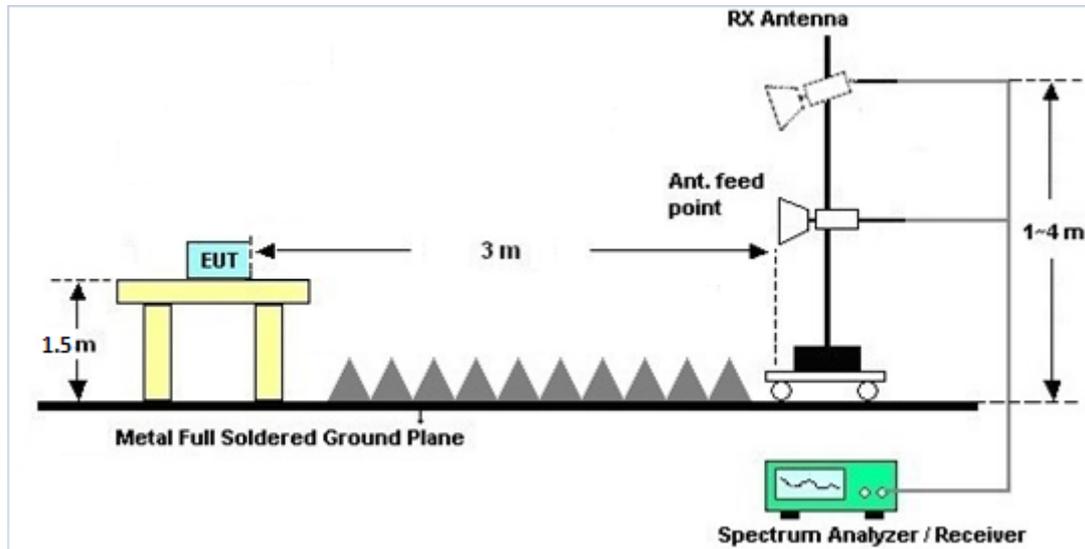
For radiated emissions below 30MHz



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 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 (dB $\mu$ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

\*Decreases with the logarithm of the frequency.

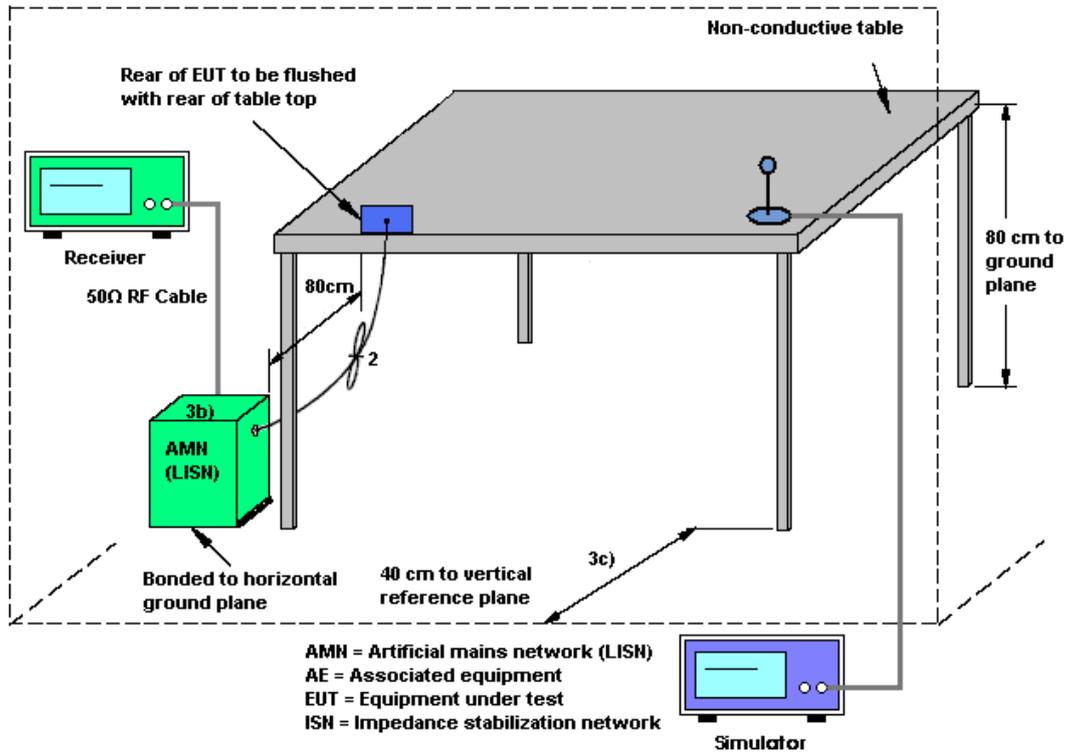
#### 3.5.2 Measuring Instruments

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

#### 3.5.3 Test Procedures

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

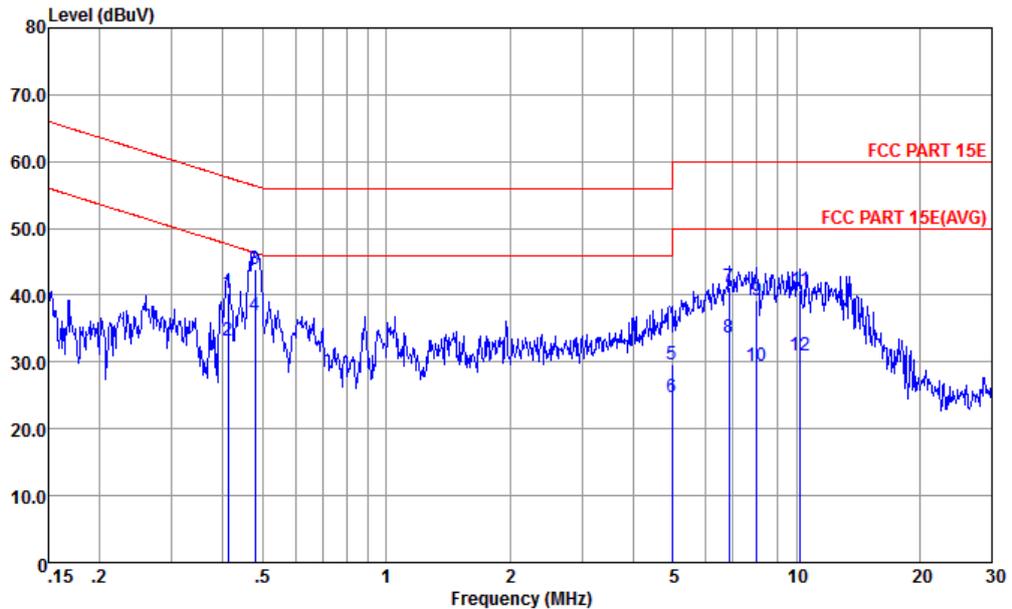
### 3.5.4 Test Setup





3.5.5 Test Result of AC Conducted Emission

Test Mode :	Mode 1	Temperature :	22~24°C
Test Engineer :	Eko Guan	Relative Humidity :	40~42%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	GSM850 Idle + Bluetooth Link + WLAN (5GHz) Link + USB Cable (Charging from Adapter) + Earphone		



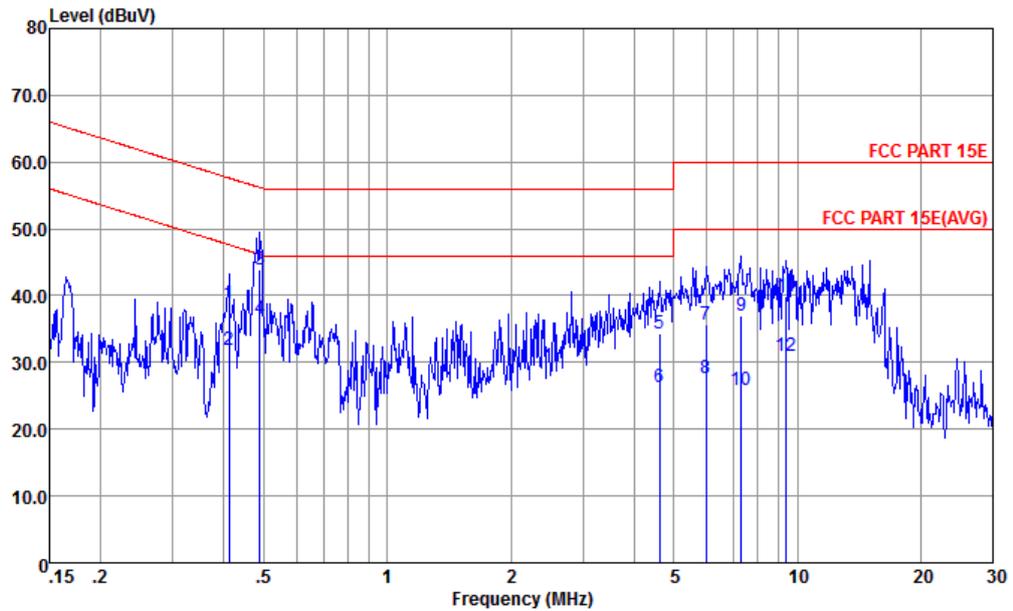
Site : CO01-KS  
 Condition : FCC PART 15E LISN-L20140306 LINE

mode : Mode 1

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.41	40.42	-17.22	57.64	29.50	0.30	10.62	QP
2	0.41	33.22	-14.42	47.64	22.30	0.30	10.62	Average
3	0.48	43.94	-12.42	56.36	33.10	0.22	10.62	QP
4 *	0.48	36.94	-9.42	46.36	26.10	0.22	10.62	Average
5	4.98	29.55	-26.45	56.00	18.50	0.20	10.85	QP
6	4.98	24.65	-21.35	46.00	13.60	0.20	10.85	Average
7	6.84	41.32	-18.68	60.00	30.20	0.20	10.92	QP
8	6.84	33.62	-16.38	50.00	22.50	0.20	10.92	Average
9	8.02	39.24	-20.76	60.00	28.10	0.20	10.94	QP
10	8.02	29.34	-20.66	50.00	18.20	0.20	10.94	Average
11	10.23	40.76	-19.24	60.00	29.60	0.20	10.96	QP
12	10.23	31.06	-18.94	50.00	19.90	0.20	10.96	Average



Test Mode :	Mode 1	Temperature :	22~24°C
Test Engineer :	Eko Guan	Relative Humidity :	40~42%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	GSM850 Idle + Bluetooth Link + WLAN (5GHz) Link + USB Cable (Charging from Adapter) + Earphone		



Site : CO01-KS  
 Condition : FCC PART 15E LISN-N20140306 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	0.41	38.81	-18.83	57.64	27.80	0.39	10.62	QP
2	0.41	31.91	-15.73	47.64	20.90	0.39	10.62	Average
3	0.49	43.83	-12.36	56.19	32.90	0.31	10.62	QP
4 *	0.49	36.53	-9.66	46.19	25.60	0.31	10.62	Average
5	4.62	34.34	-21.66	56.00	23.30	0.20	10.84	QP
6	4.62	26.34	-19.66	46.00	15.30	0.20	10.84	Average
7	5.99	35.58	-24.42	60.00	24.50	0.20	10.88	QP
8	5.99	27.68	-22.32	50.00	16.60	0.20	10.88	Average
9	7.29	36.93	-23.07	60.00	25.80	0.20	10.93	QP
10	7.29	25.93	-24.07	50.00	14.80	0.20	10.93	Average
11	9.40	39.96	-20.04	60.00	28.80	0.20	10.96	QP
12	9.40	31.06	-18.94	50.00	19.90	0.20	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.

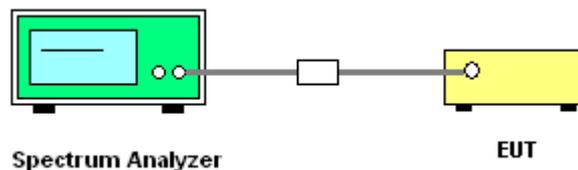
### 3.6.2 Measuring Instruments

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

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	FSP30	101400	9kHz~30GHz	Jan. 28, 2015	May 20, 2015~ Jun. 17, 2015	Jan. 27, 2016	Conducted (TH01-SZ)
Power Meter	Anritsu	ML2495A	1218010	10Hz~40GHz	Jan. 28, 2015	May 20, 2015~ Jun. 17, 2015	Jan. 27, 2016	Conducted (TH01-SZ)
Power Sensor	Anritsu	MA2411B	1207253	0.3GHz~40GHz	Jan. 28, 2015	May 20, 2015~ Jun. 17, 2015	Jan. 27, 2016	Conducted (TH01-SZ)
EMI Test Receiver	R&S	ESR7	101403	9kHz~7GHz; Max 30dBm	Sep. 29, 2014	Jun. 19, 2015	Sep. 28, 2015	Radiation (03CH02-KS)
Spectrum Analyzer	R&S	FSV40	101040	10kHz~40GHz; Max 30dBm	Sep. 25, 2014	Jun. 19, 2015	Sep. 24, 2015	Radiation (03CH02-KS)
Loop Antenna	R&S	HFH2-Z2	100321	9kHz~30MHz	Nov. 13, 2014	Jun. 19, 2015	Nov. 12, 2015	Radiation (03CH02-KS)
Bilog Antenna	TeseQ	CBL6112D	37879	30MHz~2GHz	Sep. 13, 2014	Jun. 19, 2015	Sep. 12, 2015	Radiation (03CH02-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	75957	1GHz~18GHz	Nov. 08, 2014	Jun. 19, 2015	Nov. 07, 2015	Radiation (03CH02-KS)
Active Horn Antenna	com-power	AHA-118	701030	1GHz~18GHz	Nov. 08, 2014	Jun. 19, 2015	Nov. 07, 2015	Radiation (03CH02-KS)
SHF-EHF Horn	com-power	AH-840	101070	18GHz~40GHz	Sep. 04, 2014	Jun. 19, 2015	Sep. 03, 2015	Radiation (03CH02-KS)
Amplifier	com-power	PA-103A	161069	1kHz~1000MHz / 32 dB	May 04, 2015	Jun. 19, 2015	May 03, 2016	Radiation (03CH02-KS)
Amplifier	Agilent	8449B	3008A02384	1GHz~26.5GHz Gain 30dB	Oct. 28, 2014	Jun. 19, 2015	Oct. 27, 2015	Radiation (03CH02-KS)
AC Power Source	Chroma	61601	616010002473	N/A	NCR	Jun. 19, 2015	NCR	Radiation (03CH02-KS)
Turn Table	MF	MF7802	N/A	0~360 degree	NCR	Jun. 19, 2015	NCR	Radiation (03CH02-KS)
Antenna Mast	MF	MF7802	N/A	1 m~4 m	NCR	Jun. 19, 2015	NCR	Radiation (03CH02-KS)
EMI Receiver	R&S	ESC17	100768	9kHz~7GHz;	May 04, 2015	May 08, 2015	May 03, 2016	Conduction (CO01-KS)
AC LISN	MessTec	AN3016	060103	9kHz~30MHz	Oct. 25, 2014	May 08, 2015	Oct. 24, 2015	Conduction (CO01-KS)
AC LISN (for auxiliary equipment)	MessTec	AN3016	060105	9kHz~30MHz	Oct. 25, 2014	May 08, 2015	Oct. 24, 2015	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP000000811	AC 0V~300V, 45Hz~1000Hz	Oct. 25, 2014	May 08, 2015	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
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### Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	2.5
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## **Appendix A. Conducted Test Results**

Test Engineer:	Mygai Chen	Temperature:	21~25	°C
Test Date:	2015/5/20~2015/6/17	Relative Humidity:	51~54	%

**TEST RESULTS DATA**  
**6dB and 99% OBW**

Band IV							
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	6 dB Bandwidth (MHz)	FCC 6dB Bandwidth Limit (MHz)	Pass/Fail
11a	6Mbps	1	149	5745	15.12	0.5	Pass
11a	6Mbps	1	157	5785	15.32	0.5	Pass
11a	6Mbps	1	165	5825	15.28	0.5	Pass
HT20	MCS0	1	149	5745	15.16	0.5	Pass
HT20	MCS0	1	157	5785	15.12	0.5	Pass
HT20	MCS0	1	165	5825	15.12	0.5	Pass
HT40	MCS0	1	151	5755	35.12	0.5	Pass
HT40	MCS0	1	159	5795	35.12	0.5	Pass
VHT20	MCS0	1	149	5745	15.16	0.5	Pass
VHT20	MCS0	1	157	5785	15.12	0.5	Pass
VHT20	MCS0	1	165	5825	15.12	0.5	Pass
VHT40	MCS0	1	151	5755	35.12	0.5	Pass
VHT40	MCS0	1	159	5795	35.12	0.5	Pass
VHT80	MCS0	1	155	5775	72.48	0.5	Pass

**TEST RESULTS DATA**  
**Average Power Table**

FCC 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	6Mbps	1	149	5745	0.25	10.20	30.00	0.30		Pass
11a	6Mbps	1	157	5785	0.25	9.99	30.00	0.30		Pass
11a	6Mbps	1	165	5825	0.25	9.50	30.00	0.30		Pass
HT20	MCS0	1	149	5745	0.26	10.10	30.00	0.30		Pass
HT20	MCS0	1	157	5785	0.26	9.73	30.00	0.30		Pass
HT20	MCS0	1	165	5825	0.26	9.28	30.00	0.30		Pass
HT40	MCS0	1	151	5755	0.48	9.78	30.00	0.30		Pass
HT40	MCS0	1	159	5795	0.48	9.63	30.00	0.30		Pass
VHT20	MCS0	1	149	5745	0.26	8.71	30.00	0.30		Pass
VHT20	MCS0	1	157	5785	0.26	8.13	30.00	0.30		Pass
VHT20	MCS0	1	165	5825	0.26	7.87	30.00	0.30		Pass
VHT40	MCS0	1	151	5755	0.51	8.68	30.00	0.30		Pass
VHT40	MCS0	1	159	5795	0.51	8.49	30.00	0.30		Pass
VHT80	MCS0	1	155	5775	0.85	8.00	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	6Mbps	1	149	5745	0.25	2.22	-2.82	30.00	0.30	Pass
11a	6Mbps	1	157	5785	0.25	2.22	-2.97	30.00	0.30	Pass
11a	6Mbps	1	165	5825	0.25	2.22	-3.57	30.00	0.30	Pass
HT20	MCS0	1	149	5745	0.26	2.22	-2.15	30.00	0.30	Pass
HT20	MCS0	1	157	5785	0.26	2.22	-2.04	30.00	0.30	Pass
HT20	MCS0	1	165	5825	0.26	2.22	-2.46	30.00	0.30	Pass
HT40	MCS0	1	151	5755	0.48	2.22	-5.23	30.00	0.30	Pass
HT40	MCS0	1	159	5795	0.48	2.22	-5.15	30.00	0.30	Pass
VHT20	MCS0	1	149	5745	0.26	2.22	-5.18	30.00	0.30	Pass
VHT20	MCS0	1	157	5785	0.26	2.22	-5.16	30.00	0.30	Pass
VHT20	MCS0	1	165	5825	0.26	2.22	-5.53	30.00	0.30	Pass
VHT40	MCS0	1	151	5755	0.51	2.22	-7.92	30.00	0.30	Pass
VHT40	MCS0	1	159	5795	0.51	2.22	-7.93	30.00	0.30	Pass
VHT80	MCS0	1	155	5775	0.85	2.22	-11.32	30.00	0.30	Pass

**TEST RESULTS DATA**  
**Frequency Stability**

Band IV										
Mod.	Data Rate	Ntx	CH.	Freq. (MHz)	Center Frequency (MHz)	Frequency Deviation (MHz)	Frequency Stability (ppm)	Temperature (°C)	Voltage (V)	Note
11a	6Mbps	1	149	5745	5745.025	0.025	4.35	20	3.5	
11a	6Mbps	1	149	5745	5745.050	0.050	8.70	20	4.2	
11a	6Mbps	1	149	5745	5745.025	0.025	4.35	20	3.8	
11a	6Mbps	1	149	5745	5745.050	0.050	8.70	-10	3.8	
11a	6Mbps	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	*	5746	101.99	-	-	95.61	35.19	7.48	36.29	173	40	P	H
	*	5748	91.8	-	-	85.42	35.19	7.48	36.29	173	40	A	H
	!	5713.53	65.13	-8.87	74	58.79	35.16	7.45	36.27	173	40	P	H
		5709.12	40.46	-13.54	54	34.12	35.16	7.45	36.27	173	40	A	H
		5724.92	69.39	-8.91	78.3	63.02	35.18	7.47	36.28	173	40	P	H
	*	5746	102.31	-	-	95.93	35.19	7.48	36.29	150	196	P	V
	*	5742	92.7	-	-	86.32	35.19	7.48	36.29	150	196	A	V
	!	5713.14	66.75	-7.25	74	60.41	35.16	7.45	36.27	150	196	P	V
		5710.74	41.34	-12.66	54	35	35.16	7.45	36.27	150	196	A	V
		5724.92	70.39	-7.91	78.3	64.02	35.18	7.47	36.28	150	196	P	V
802.11a CH 157 5785MHz	*	5788	100.88	-	-	94.43	35.24	7.53	36.32	294	41	P	H
	*	5788	90.64	-	-	84.19	35.24	7.53	36.32	294	41	A	H
	*	5788	101.63	-	-	95.18	35.24	7.53	36.32	156	360	P	V
	*	5788	91.85	-	-	85.4	35.24	7.53	36.32	156	360	A	V



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 165 5825MHz	*	5822	99.6	-	-	93.11	35.27	7.57	36.35	150	1	P	H
	*	5822	90.01	-	-	83.52	35.27	7.57	36.35	150	1	A	H
		5851.04	65.26	-13.04	78.3	58.75	35.28	7.59	36.36	150	1	P	H
		5860.4	60.55	-7.75	68.3	54.01	35.3	7.61	36.37	150	1	P	H
	*	5828	101.08	-	-	94.59	35.27	7.57	36.35	213	189	P	V
	*	5826	90.88	-	-	84.39	35.27	7.57	36.35	213	189	A	V
		5850.88	67.64	-10.66	78.3	61.13	35.28	7.59	36.36	213	189	P	V
	!	5860.32	62.07	-6.23	68.3	55.53	35.3	7.61	36.37	213	189	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		11490	47.51	-26.49	74	53.55	39.11	15.39	60.54	150	131	P	H
5745MHz		11490	47.68	-26.32	74	53.72	39.11	15.39	60.54	177	22	P	V
802.11a CH 157		11571	49.16	-24.84	74	55.07	39.14	15.45	60.5	111	131	P	H
5785MHz		11571	48.63	-25.37	74	54.54	39.14	15.45	60.5	150	0	P	V
802.11a CH 165		11649	47.42	-26.58	74	53.23	39.16	15.5	60.47	132	10	P	H
5825MHz		11649	47.93	-26.07	74	53.74	39.16	15.5	60.47	148	36	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 )
802.11n HT20 CH 149 5745MHz	*	5744	101.13	-	-	94.75	35.19	7.48	36.29	150	331	P	H
	*	5744	91.32	-	-	84.94	35.19	7.48	36.29	150	331	A	H
		5724.68	68.95	-9.35	78.3	62.58	35.18	7.47	36.28	150	331	P	H
		5714.76	65.48	-8.52	74	59.14	35.16	7.45	36.27	150	331	P	H
		5713.89	40.59	-13.41	54	34.25	35.16	7.45	36.27	150	331	A	H
	*	5746	98.94	-	-	92.56	35.19	7.48	36.29	150	107	P	V
	*	5748	88.92	-	-	82.54	35.19	7.48	36.29	150	107	A	V
	!	5714.44	64.69	-3.61	68.3	58.35	35.16	7.45	36.27	150	107	P	V
		5724.92	67.71	-10.59	78.3	61.34	35.18	7.47	36.28	150	107	P	V
802.11n HT20 CH 157 5785MHz	*	5784	100.38	-	-	93.96	35.22	7.51	36.31	150	163	P	H
	*	5782	90.62	-	-	84.2	35.22	7.51	36.31	150	163	A	H
	*	5784	98.3	-	-	91.88	35.22	7.51	36.31	150	19	P	V
	*	5782	88.24	-	-	81.82	35.22	7.51	36.31	150	19	A	V
802.11n HT20 CH 165 5825MHz	*	5828	100.34	-	-	93.85	35.27	7.57	36.35	150	6	P	H
	*	5828	90.1	-	-	83.61	35.27	7.57	36.35	150	6	A	H
		5850.4	66.04	-12.26	78.3	59.53	35.28	7.59	36.36	150	6	P	H
	!	5862.72	60.79	-7.51	68.3	54.25	35.3	7.61	36.37	150	6	P	H
	*	5830	99.86	-	-	93.37	35.27	7.57	36.35	150	161	P	V
	*	5828	89.87	-	-	83.38	35.27	7.57	36.35	150	162	A	V
		5850.8	64.95	-13.35	78.3	58.44	35.28	7.59	36.36	150	162	P	V
!	5861.76	59.83	-8.47	68.3	53.29	35.3	7.61	36.37	150	162	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	48.21	-25.79	74	54.25	39.11	15.39	60.54	200	122	P	H
		11490	46.51	-27.49	74	52.55	39.11	15.39	60.54	150	112	P	V
802.11n HT20 CH 157 5785MHz		11571	50.12	-23.88	74	56.03	39.14	15.45	60.5	150	178	P	H
		11571	48.11	-25.89	74	54.02	39.14	15.45	60.5	162	0	P	V
802.11n HT20 CH 165 5825MHz		11649	48.12	-25.88	74	53.93	39.16	15.5	60.47	154	225	P	H
		11649	48.02	-25.98	74	53.83	39.16	15.5	60.47	150	22	P	V
<b>Remark</b>	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. 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	*	5764	99.04	-	-	92.63	35.21	7.5	36.3	176	22	P	H
	*	5762	89.04	-	-	82.63	35.21	7.5	36.3	176	22	A	H
	!	5721.32	71.16	-7.14	78.3	64.79	35.18	7.47	36.28	176	22	P	H
	!	5714.49	68.34	-5.66	74	62	35.16	7.45	36.27	176	22	P	H
		5714.97	41.19	-12.81	54	34.85	35.16	7.45	36.27	176	22	A	H
	*	5752	97.35	-	-	90.94	35.21	7.5	36.3	150	158	P	V
	*	5750	87.62	-	-	81.24	35.19	7.48	36.29	150	158	A	V
	!	5722.04	71.54	-6.76	78.3	65.17	35.18	7.47	36.28	150	158	P	V
	!	5714.4	69.8	-4.2	74	63.46	35.16	7.45	36.27	150	158	P	V
	5714.97	41.95	-12.05	54	35.61	35.16	7.45	36.27	150	158	A	V	
802.11n HT40 CH 159 5795MHz	*	5790	97.55	-	-	91.1	35.24	7.53	36.32	150	237	P	H
	*	5788	88.19	-	-	81.74	35.24	7.53	36.32	150	237	A	H
		5851.92	60.13	-18.17	78.3	53.62	35.28	7.59	36.36	150	237	P	H
		5861.04	56.69	-11.61	68.3	50.15	35.3	7.61	36.37	150	237	P	H
	*	5800	95.49	-	-	89.04	35.24	7.53	36.32	150	13	P	V
	*	5800	86.2	-	-	79.75	35.24	7.53	36.32	150	13	A	V
		5850.48	57.38	-20.92	78.3	50.87	35.28	7.59	36.36	150	13	P	V
	5861.84	56.98	-11.32	68.3	50.44	35.3	7.61	36.37	150	13	P	V	
<b>Remark</b>	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. 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		11511	48.21	-25.79	74	54.24	39.11	15.4	60.54	150	162	P	H
802.11n HT40 CH 159 5795MHz		11511	47.52	-26.48	74	53.55	39.11	15.4	60.54	150	88	P	V
802.11n HT40 CH 159 5795MHz		11589	48.26	-25.74	74	54.14	39.15	15.46	60.49	150	162	P	H
802.11n HT40 CH 159 5795MHz		11590	48.11	-25.89	74	53.99	39.15	15.46	60.49	150	187	P	V
<b>Remark</b>	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	*	5774	99.96	-	-	91.34	32.5	10.86	34.74	201	174	P	H
	*	5780	85.63	-	-	76.98	32.5	10.89	34.74	201	174	A	H
	!	5713.08	65.76	-2.54	68.3	57.34	32.33	10.79	34.7	201	174	P	H
		5724.44	67.51	-10.79	78.3	59.03	32.37	10.82	34.71	201	174	P	H
		5851.28	60.49	-17.81	78.3	51.71	32.59	10.95	34.76	201	174	P	H
		5870.08	58.01	-10.29	68.3	49.2	32.61	10.96	34.76	201	174	P	H
	*	5774	96.97	-	-	88.35	32.5	10.86	34.74	215	339	P	V
	*	5780	84.2	-	-	75.55	32.5	10.89	34.74	215	339	A	V
	!	5713.08	63.04	-5.26	68.3	54.62	32.33	10.79	34.7	215	339	P	V
		5724.84	66.44	-11.86	78.3	57.96	32.37	10.82	34.71	215	339	P	V
	5851.28	59	-19.3	78.3	50.22	32.59	10.95	34.76	215	339	P	V	
	5868	56.92	-11.38	68.3	48.11	32.61	10.96	34.76	215	339	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		11550	47.44	-26.56	74	53.4	39.13	15.42	60.51	169	248	P	H
CH 155 5775MHz		11550	47.04	-26.96	74	53	39.13	15.42	60.51	144	235	P	V
<b>Remark</b>	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Emission below 1GHz  
5GHz WIFI 802.11a (LF @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.		( MHz )	( dBμV/m )	( dB )	( dBμV/m )	( dBμV )	( dB/m )	( dB )	( dB )	( cm )	( deg )	( P/A )	( H/V )
5GHz 802.11a LF		98.87	22.84	-20.66	43.5	44.38	11.96	1.8	35.3	100	285	P	H
		225.94	25.19	-20.81	46	47.39	10.44	2.33	34.97	-	-	P	H
		340.4	23.77	-22.23	46	41.3	14.39	3.1	35.02	-	-	P	H
		474.26	23.4	-22.6	46	37.41	17.14	3.58	34.73	-	-	P	H
		563.5	23.79	-22.21	46	35.89	18.28	4.24	34.62	-	-	P	H
		646.92	22.89	-23.11	46	34.13	18.97	4.62	34.83	-	-	P	H
		30	29.48	-10.52	40	44.43	19.1	1.17	35.22	100	148	P	V
		98.87	20.88	-22.62	43.5	42.42	11.96	1.8	35.3	-	-	P	V
		221.09	25.66	-20.34	46	48.08	10.25	2.32	34.99	-	-	P	V
		288.02	24.51	-21.49	46	43.67	13.01	2.61	34.78	-	-	P	V
		341.37	28.23	-17.77	46	45.74	14.41	3.11	35.03	-	-	P	V
		473.29	20.9	-25.1	46	34.91	17.14	3.58	34.73	-	-	P	V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												



Emission below 1GHz

5GHz WIFI 802.11n HT20 (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 802.11n HT20 LF		98.87	21.84	-21.66	43.5	43.38	11.96	1.8	35.3	-	-	P	H
		223.03	29.83	-16.17	46	52.17	10.32	2.33	34.99	145	221	P	H
		346.22	24.8	-21.2	46	42.18	14.52	3.16	35.06	-	-	P	H
		489.78	24.92	-21.08	46	38.62	17.24	3.68	34.62	-	-	P	H
		767.2	22.49	-23.51	46	32.28	19.97	4.69	34.45	-	-	P	H
		845.77	23.1	-22.9	46	31.31	21.04	5.1	34.35	-	-	P	H
		30	28.48	-11.52	40	43.43	19.1	1.17	35.22	200	152	P	V
		98.87	19.88	-23.62	43.5	41.42	11.96	1.8	35.3	-	-	P	V
		221.09	27.66	-18.34	46	50.08	10.25	2.32	34.99	-	-	P	V
		305.48	23.99	-22.01	46	42.41	13.63	2.74	34.79	-	-	P	V
		473.29	16.9	-29.1	46	30.91	17.14	3.58	34.73	-	-	P	V
	555.74	19.32	-26.68	46	31.44	18.23	4.2	34.55	-	-	P	V	
Remark	1. No other spurious found. 2. All results are PASS against 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.	
1		( MHz )	( dBμV/m )	( dB )	( dBμV/m )	( dBμV )	( dB/m )	( dB )	( dB )	( cm )	( deg )	( P/A )	( H/V )
5GHz 802.11n HT40 LF		98.87	20.84	-22.66	43.5	42.38	11.96	1.8	35.3	-	-	P	H
		191.02	27.96	-15.54	43.5	50.98	9.72	2.29	35.03	-	-	P	H
		223.03	30.83	-15.17	46	53.17	10.32	2.33	34.99	100	226	P	H
		346.22	23.8	-22.2	46	41.18	14.52	3.16	35.06	-	-	P	H
		545.07	22.92	-23.08	46	35.19	18.11	4.12	34.5	-	-	P	H
		716.76	21.97	-24.03	46	32.47	19.47	4.73	34.7	-	-	P	H
		30	30.48	-9.52	40	45.43	19.1	1.17	35.22	200	229	P	V
		98.87	21.88	-21.62	43.5	43.42	11.96	1.8	35.3	-	-	P	V
		221.09	29.66	-16.34	46	52.08	10.25	2.32	34.99	-	-	P	V
		340.4	20.62	-25.38	46	38.15	14.39	3.1	35.02	-	-	P	V
		473.29	15.9	-30.1	46	29.91	17.14	3.58	34.73	-	-	P	V
	555.74	18.32	-27.68	46	30.44	18.23	4.2	34.55	-	-	P	V	
Remark	1. No other spurious found. 2. All results are PASS against limit line.												



**Emission below 1GHz**  
**5GHz WIFI 802.11acVHT80 (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		105.66	26.07	-17.43	43.5	47.58	12	1.82	35.33	100	162	P	H
		239.52	23.3	-22.7	46	44.88	10.98	2.35	34.91	-	-	P	H
		337.49	25.19	-20.81	46	42.8	14.33	3.07	35.01	-	-	P	H
		515	26.68	-19.32	46	39.78	17.56	3.87	34.53	-	-	P	H
		705.12	21.01	-24.99	46	31.69	19.35	4.77	34.8	-	-	P	H
		852.56	22.02	-23.98	46	30.12	21.12	5.13	34.35	-	-	P	H
		30	31.48	-8.52	40	46.43	19.1	1.17	35.22	100	187	P	V
		98.87	22.88	-20.62	43.5	44.42	11.96	1.8	35.3	-	-	P	V
		156.1	23.62	-19.88	43.5	45.62	10.99	1.93	34.92	-	-	P	V
		341.37	26.23	-19.77	46	43.74	14.41	3.11	35.03	-	-	P	V
		473.29	23.9	-22.1	46	37.91	17.14	3.58	34.73	-	-	P	V
	555.74	22.32	-23.68	46	34.44	18.23	4.2	34.55	-	-	P	V	
<b>Remark</b>	1. No other spurious found. 2. All results are PASS against limit line.												



ote symbol

*	<b>Fundamental Frequency</b> which can be ignored. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency.
!	Test result is <b>over limit</b> line.
P/A	<b>Peak</b> or <b>Average</b>
H/V	<b>Horizontal</b> or <b>Vertical</b>



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		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
CH 01													
2412MHz		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”.