FCC RF Test Report

APPLICANT	**:**	**ZTE CORPORATION**
EQUIPMENT	**:**	**LTE/WCDMA Tablet**
BRAND NAME	**:**	**ZTE**
MODEL NAME	**:**	**K92**
FCC ID	**:**	**SRQ-K92**
STANDARD	**:**	**FCC Part 15 Subpart E §15.407**
CLASSIFICATION	**:**	**(NII) Unlicensed National Information Infrastructure**

The product was received on Mar. 10, 2017 and testing was completed on May 04, 2017. 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.

James Huang

Prepared by: James Huang / Manager

Jones Tsai

Approved by: Jones Tsai / Manager

Testing Laboratory 2627

Sporton International (KunShan) INC.

No.3-2, Pingxiang Road, Kunshan Development Zone, Jiangsu, China

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR731003D	Rev. 01	Initial issue of report	May 08, 2017

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	2.1049 15.403(i)	26dB & 99% Bandwidth	-	Pass	-
3.2	15.407(a)	Maximum Conducted Output Power	FCC ≤ 24 dBm (depend on band)	Pass	-
3.3	15.407(a)	Power Spectral Density	FCC ≤ 11 dBm (depend on band)	Pass	-
3.4	15.407(b)	Unwanted Emissions	15.407(b) 15.209(a)	Pass	Under limit 1.05 dB at 5147.200 MHz
3.5	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 15.49 dB at 9.204 MHz
0	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 Product Feature of Equipment Under Test

Product Feature	
Equipment	LTE/WCDMA Tablet
Brand Name	ZTE
Model Name	K92
FCC ID	SRQ-K92
EUT supports Radios application	WCDMA/HSPA/DC-HSDPA/ HSPA+(16QAM uplink is not supported)/LTE WLAN2.4GHz 802.11b/g/n HT20/HT40 WLAN5GHz 802.11a/n HT20/HT40 WLAN5GHz 802.11ac VHT20/VHT40/VHT80 Bluetooth v3.0+EDR/ Bluetooth v4.0 LE Bluetooth v4.1 LE/ Bluetooth v4.2 LE
HW Version	K92HWB01
SW Version	K92V1.0.0B01
EUT Stage	Identical Prototype

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

1.4 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx/Rx Frequency Range	5180 MHz ~ 5240 MHz
Maximum Output Power to Antenna	802.11a : 11.10 dBm / 0.0129 W 802.11n HT20 : 11.13 dBm / 0.0130 W 802.11n HT40 : 10.29 dBm / 0.0107 W 802.11ac VHT80 : 9.82 dBm / 0.0096 W
99% Occupied Bandwidth	802.11a : 18.88 MHz 802.11n HT20 : 19.53 MHz 802.11n HT40 : 36.76 MHz 802.11ac VHT80 : 74.93 MHz
Antenna Type / Gain	PIFA Antenna with gain 4.30 dBi
Type of Modulation	802.11a/n : OFDM (BPSK / QPSK / 16QAM / 64QAM) 802.11ac : OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM)

Note:

For 802.11n HT20 / ac VHT20 and 802.11n HT40 / ac VHT40 mode, the whole testing are assessed only 802.11n HT20/ HT40 by referring to their maximum conducted power.

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 Development Zone, Jiangsu, China TEL: +86-0512-5790-0158 FAX: +86-0512-5790-0958			
Test Site No.	**Sporton Site No.**			**FCC Registration No.**
	TH01-KS	CO01-KS	03CH03-KS	306251

Note: The test site complies with ANSI C63.4 2014 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 v01r04
- FCC KDB 644545 D03 Guidance for IEEE 802 11ac 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. 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.

2.1 Carrier Frequency Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5180-5240 MHz Band 1 (U-NII-1)	36	5180	44	5220
	38*	5190	46*	5230
	40	5200	48	5240
	42#	5210	-	-

Note:

1. The above Frequency and Channel in "*" were 802.11n HT40 and 802.11ac VHT40.
2. The above Frequency and Channel in "#" were 802.11ac VHT80.

2.2 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 VHT80	MCS0

AC Conducted Emission	Mode 1 : WCDMA Band V Idle + Bluetooth Link + WLAN Link (5G) + USB Cable (Charging from Adapter) + Earphone

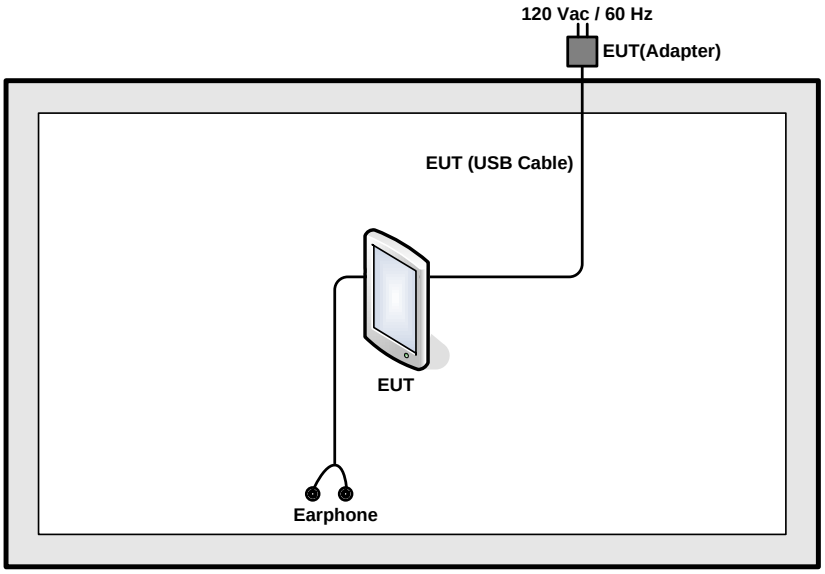
Ch. #		Band I：5180-5240 MHz		
		802.11a	802.11n HT20	802.11n HT40
L	Low	36	36	38
M	Middle	44	44	-
H	High	48	48	46
Straddle		-	-	-

Ch. #		Band I：5180-5240 MHz
		802.11ac VHT80
L	Low	-
M	Middle	42
H	High	-
Straddle		-

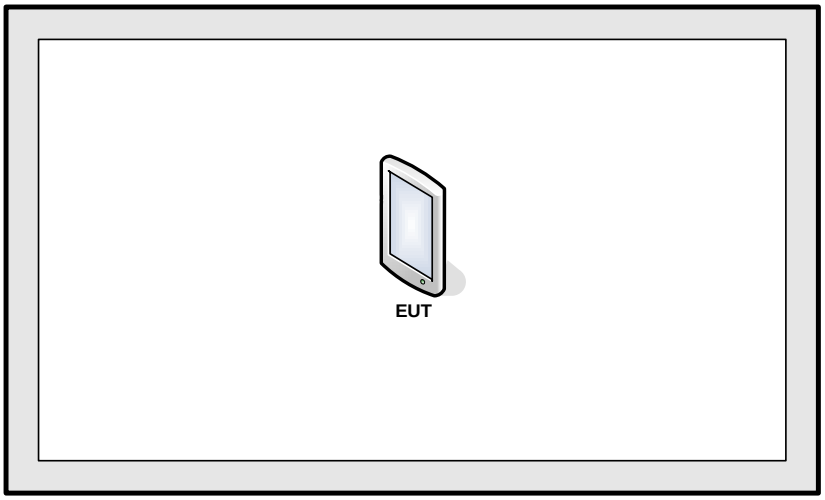
2.3 Connection Diagram of Test System

<WLAN Tx Mode>

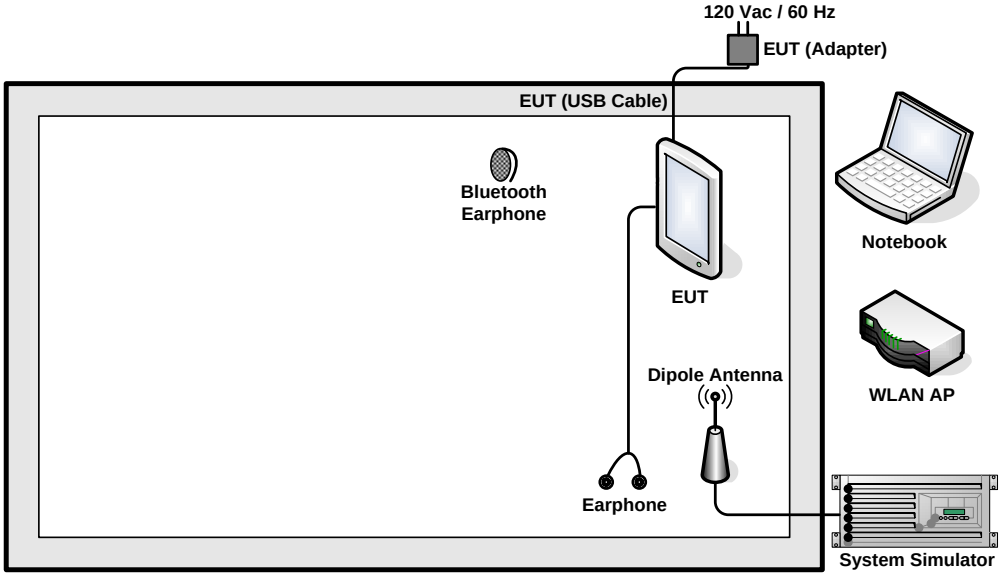
For 802.11a, 802.11n HT20, 802.11ac VHT80



For 802.11n HT40



<AC Conducted Emission Mode>



2.4 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	D-Link	DIR-855	KA2DIR855A2	N/A	Unshielded, 1.8 m
3.	Notebook	Lenovo	G480	FCC DoC	N/A	AC I/P: Unshielded, 1.8 m DC O/P: Shielded, 1.8 m
4.	Bluetooth Earphone	Lenovo	LBH308	N/A	N/A	N/A
5.	Earphone	Lenovo	LH102	N/A	N/A	Unshielded, 1.2 m

2.5 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 Notebook under large package sizes transmission.

2.6 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 6.9 dB.

Offset (dB) = RF cable loss(dB).
= 6.9 (dB)

3 Test Result

3.1 26dB & 99% Occupied Bandwidth Measurement

3.1.1 Description of 26dB & 99% Occupied Bandwidth

This section is for reporting purpose only.

There is no restriction limits for bandwidth.

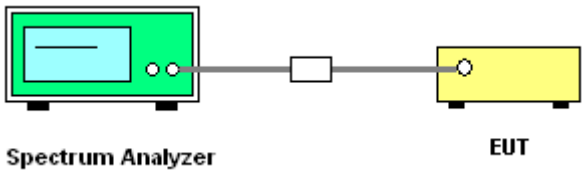
3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r04. Section C) Emission bandwidth
2. Set RBW = approximately 1% of the emission bandwidth.
3. Set the VBW > RBW.
4. Detector = Peak.
5. Trace mode = max hold
6. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.
7. For 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) is set 1MHz and set the Video bandwidth (VBW) ≥ 3 * RBW.
8. Measure and record the results in the test report.

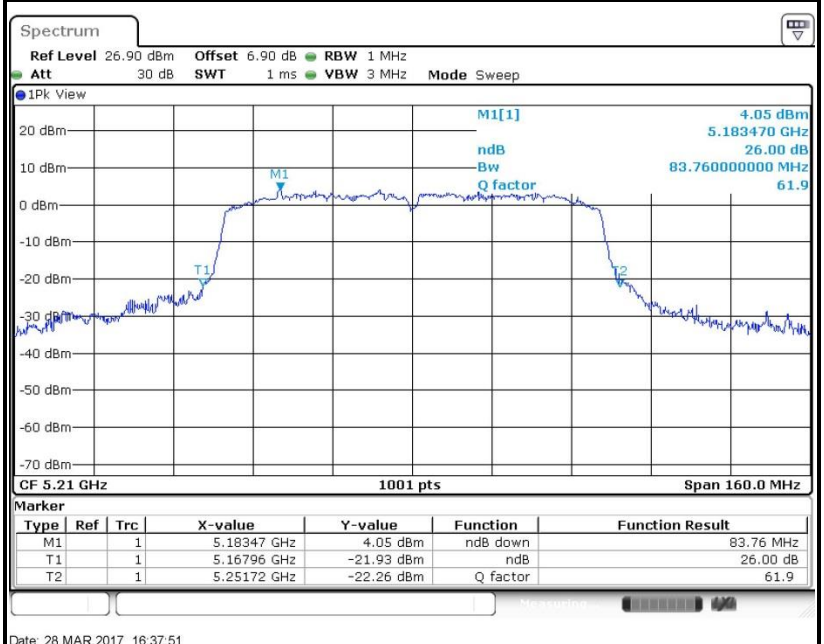
3.1.4 Test Setup



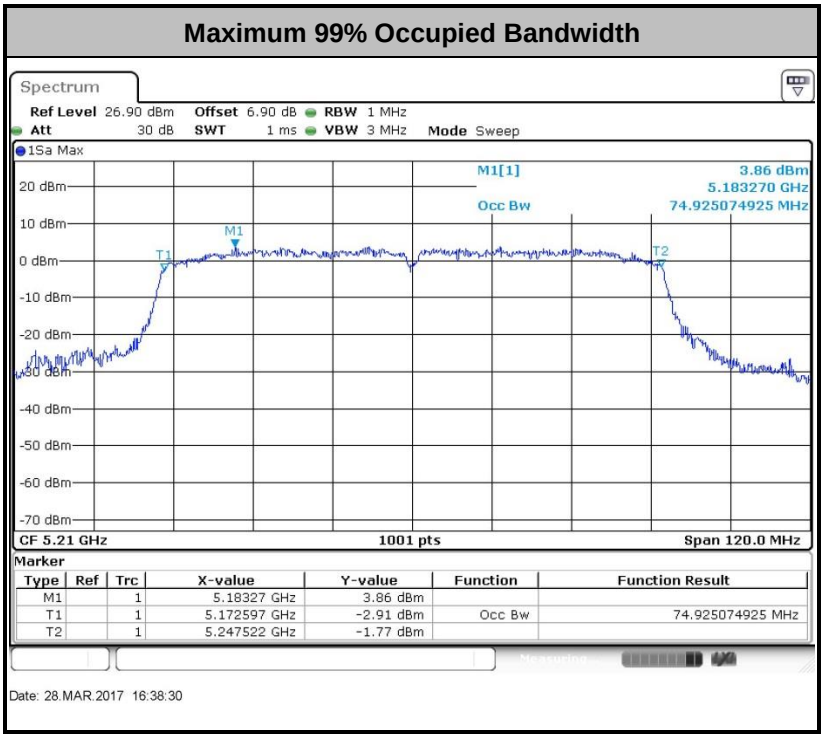
3.1.5 Test Result of 26dB & 99% Occupied Bandwidth Plots

Please refer to Appendix A.

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

<FCC 14-30 CFR 15.407>

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

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.

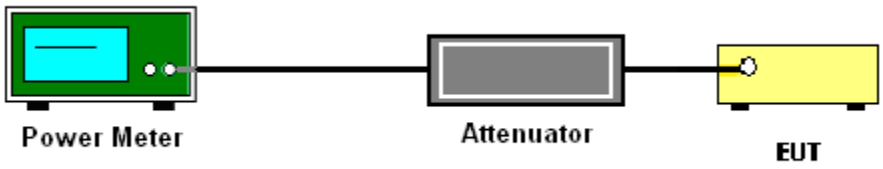
3.2.3 Test Procedures

The testing follows Method PM of FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r04.

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



3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

<FCC 14-30 CFR 15.407>

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

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

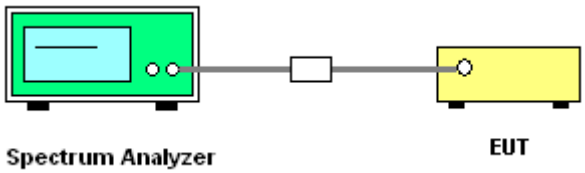
The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r04. Section F) Maximum power spectral density.

 # Method SA-2 #

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

1. The testing follows Method SA-2 of FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r04.
   - Measure the duty cycle.
   - Set span to encompass the entire emission bandwidth (EBW) of the signal.
   - Set RBW = 1 MHz.
   - Set VBW ≥ 3 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(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.

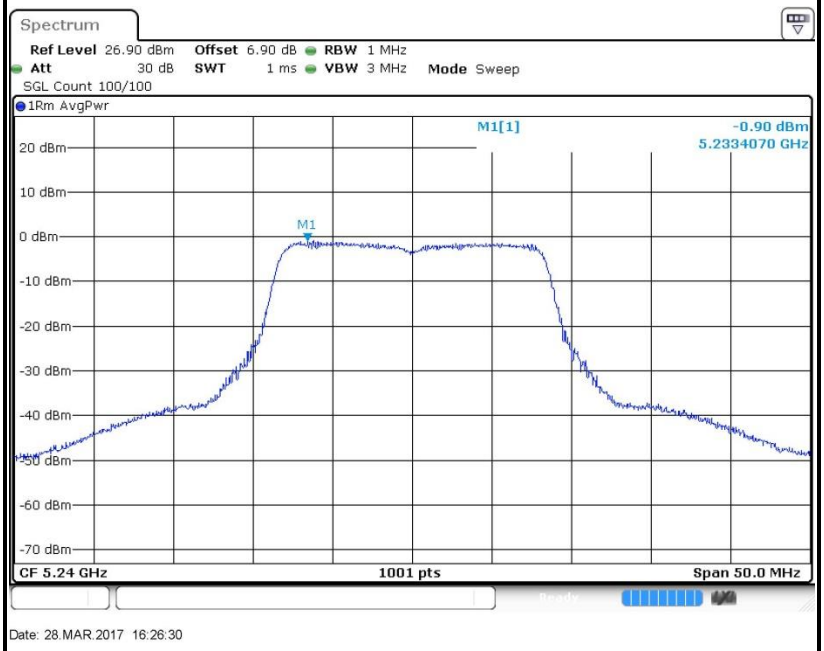
3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.

Worst Case Power Spectral Density(dBm/MHz)



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

3.4 Unwanted Radiated Emission Measurement

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

3.4.1 Limit of Unwanted Emissions

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

(2) Unwanted spurious emissions fallen in restricted bands shall comply with the general field strength limits as below table

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

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

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

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

(3) KDB789033 D01 v01r03 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 v01r04. 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

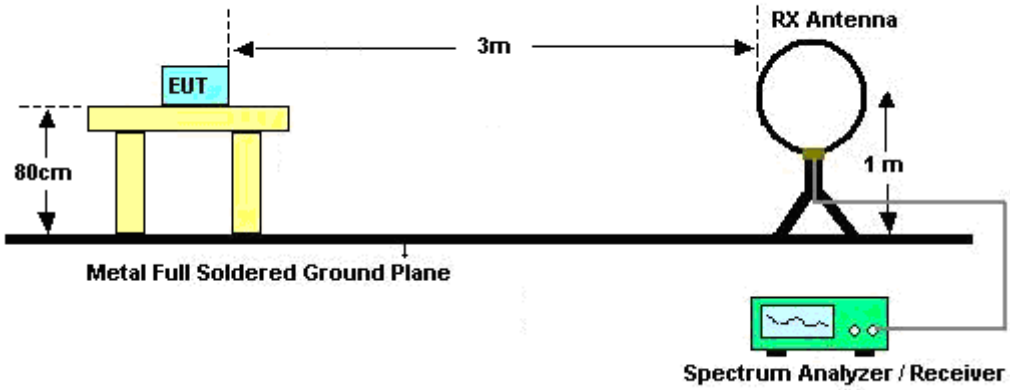
   (3) Procedures for Average Unwanted Emissions Measurements Above 1000MHz

   - 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.

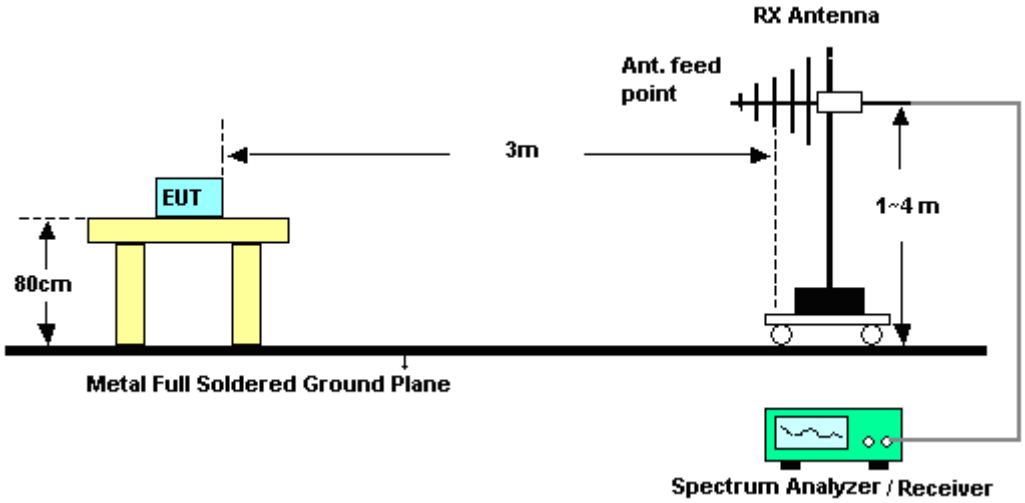
2. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
3. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
4. The antenna is a broadband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

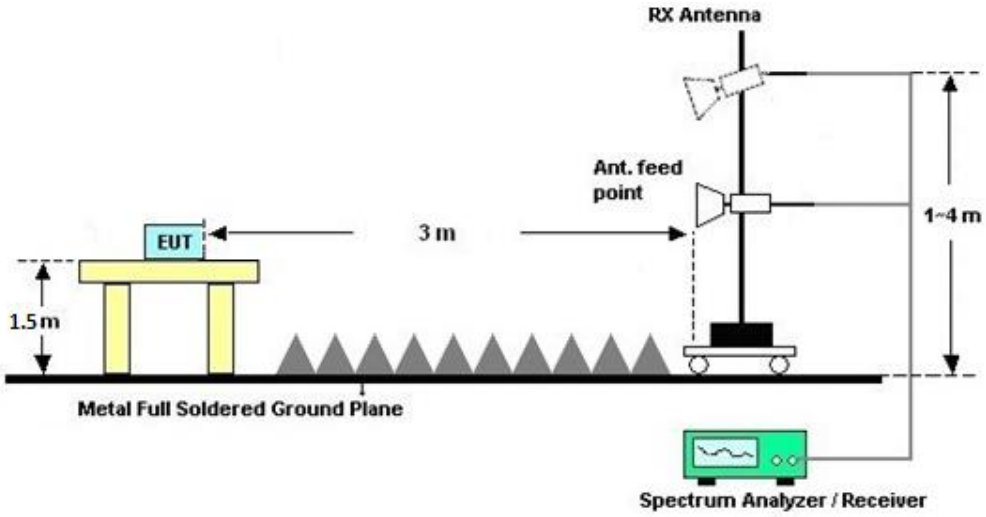
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



3.4.5 Test Results of Radiated Spurious 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 was not reported.

3.4.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix B.

3.4.7 Duty Cycle

Please refer to Appendix C.

3.4.8 Test Result of Radiated Spurious Emissions (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.

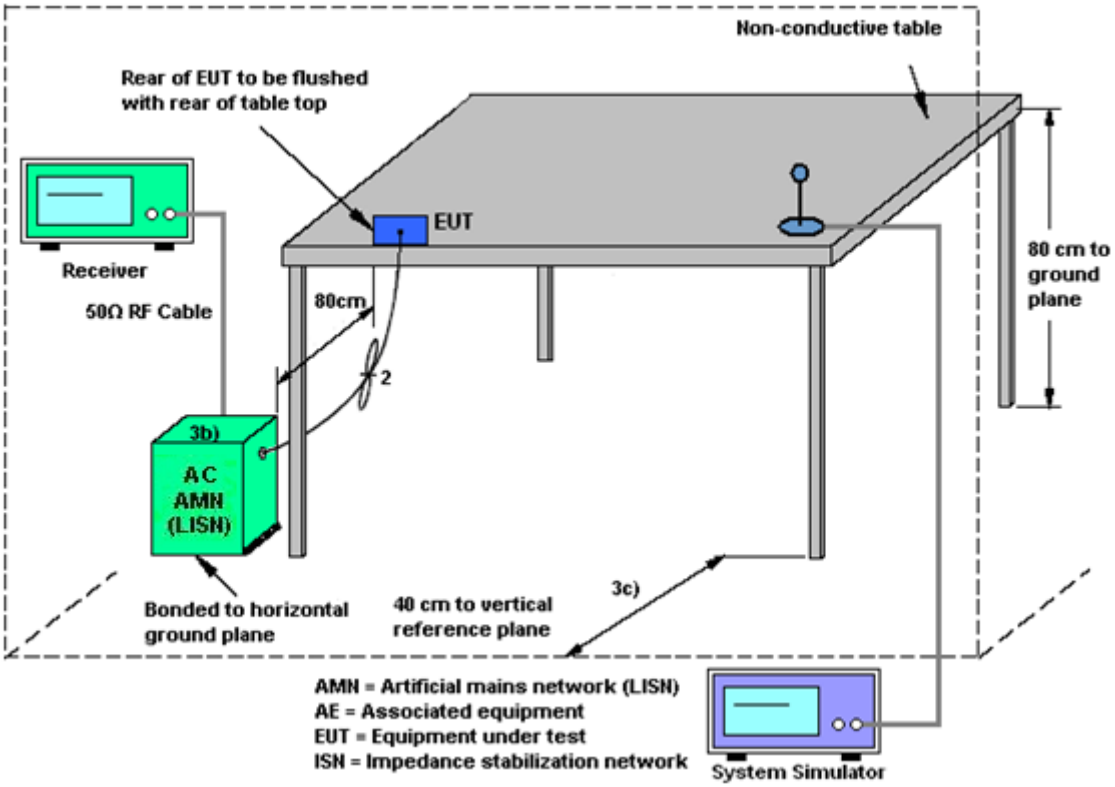
3.5.2 Measuring Instruments

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

3.5.3 Test Procedures

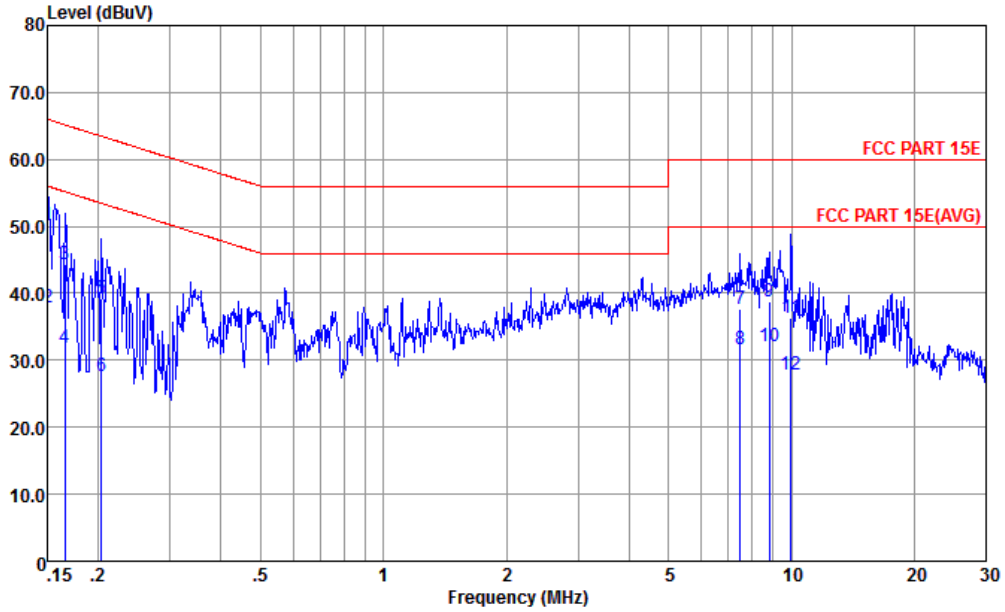
1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
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 :**	42~46%
Test Voltage :	120Vac / 60Hz	**Phase :**	Line
Function Type :	WCDMA Band V Idle + Bluetooth Link + WLAN Link (5G) + USB Cable (Charging from Adapter) + Earphone		

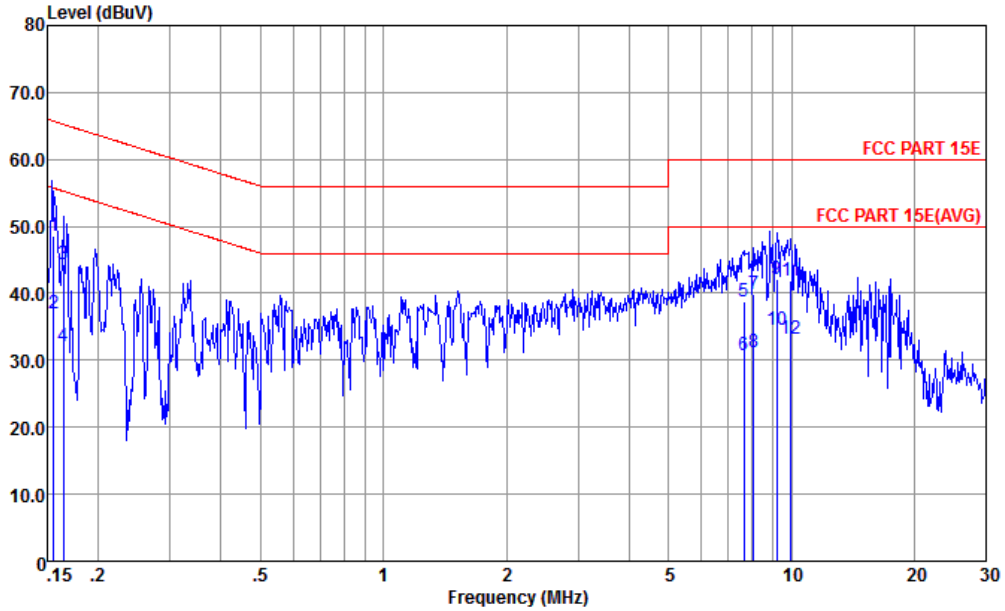


Site : CO01-KS
Condition : FCC PART 15E LISN-L-20151024 LINE

mode : Mode 1
: 863862030008394 #15

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1 *	0.150	50.22	-15.78	66.00	39.30	0.53	10.39	QP
2	0.150	37.82	-18.18	56.00	26.90	0.53	10.39	Average
3	0.166	44.40	-20.76	65.16	33.61	0.42	10.37	QP
4	0.166	31.90	-23.26	55.16	21.11	0.42	10.37	Average
5	0.204	39.15	-24.30	63.45	28.60	0.22	10.33	QP
6	0.204	27.65	-25.80	53.45	17.10	0.22	10.33	Average
7	7.486	37.73	-22.27	60.00	27.21	0.23	10.29	QP
8	7.486	31.63	-18.37	50.00	21.11	0.23	10.29	Average
9	8.822	38.86	-21.14	60.00	28.30	0.24	10.32	QP
10	8.822	32.16	-17.84	50.00	21.60	0.24	10.32	Average
11	9.966	36.39	-23.61	60.00	25.80	0.25	10.34	QP
12	9.966	27.89	-22.11	50.00	17.30	0.25	10.34	Average

Test Mode :	Mode 1	Temperature :	22~24℃
Test Engineer :	Amos Zhang	Relative Humidity :	42~46%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	WCDMA Band V Idle + Bluetooth Link + WLAN Link (5G) + USB Cable (Charging from Adapter) + Earphone		



Site : CO01-KS
Condition : FCC PART 15E LISN-N-20151024 NEUTRAL

mode : Mode 1
: 863862030008394 #15

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.156	48.59	-17.10	65.69	37.90	0.30	10.39	QP
2	0.156	36.89	-18.80	55.69	26.20	0.30	10.39	Average
3	0.164	44.28	-20.97	65.25	33.61	0.30	10.37	QP
4	0.164	31.98	-23.27	55.25	21.31	0.30	10.37	Average
5	7.646	38.79	-21.21	60.00	28.20	0.29	10.30	QP
6	7.646	30.79	-19.21	50.00	20.20	0.29	10.30	Average
7	8.062	39.79	-20.21	60.00	29.19	0.29	10.31	QP
8	8.062	31.19	-18.81	50.00	20.59	0.29	10.31	Average
9	9.204	42.11	-17.89	60.00	31.50	0.28	10.33	QP
10 *	9.204	34.51	-15.49	50.00	23.90	0.28	10.33	Average
11	9.966	41.92	-18.08	60.00	31.30	0.28	10.34	QP
12	9.966	33.22	-16.78	50.00	22.60	0.28	10.34	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

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

3.8.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.8.3 Antenna Gain

The antenna gain is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.

4 List of Measuring Equipments

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV40	101040	10Hz~40GHz	Aug. 09, 2016	Mar. 26, 2017~ Mar. 28, 2017	Aug. 08, 2017	Conducted (TH01-KS)
Pulse Power Senor	Anritsu	MA2411B	0917070	300MHz~40GHz	Jan. 19, 2017	Mar. 26, 2017~ Mar. 28, 2017	Jan. 19, 2018	Conducted (TH01-KS)
Power Meter	Anritsu	ML2495A	1005002	50MHz Bandwidth	Jan. 19, 2017	Mar. 26, 2017~ Mar. 28, 2017	Jan. 19, 2018	Conducted (TH01-KS)
Thermal Chamber	Ten Billion	TTC-B3S	TBN-960502	-40~+150°C	Oct.13, 2016	Mar. 26, 2017~ Mar. 28, 2017	Oct. 13, 2017	Conducted (TH01-KS)
EMI Test Receiver	Keysight	N9038A	MY56400004	3Hz~8.5GHz;Max 30dBm	Oct. 22, 2016	Mar. 26, 2017~ May 04, 2017	Oct. 21, 2017	Radiation (03CH03-KS)
EXA Spectrum Analyzer	Keysight	N9010A	MY55150244	10Hz-44GHz	Mar. 18, 2017	Mar. 26, 2017~ May 04, 2017	Mar. 17, 2018	Radiation (03CH03-KS)
Loop Antenna	R&S	HFH2-Z2	100321	9kHz~30MHz	Nov. 23, 2016	Mar. 26, 2017~ May 04, 2017	Nov. 22, 2017	Radiation (03CH03-KS)
Bilog Antenna	TeseQ	CBL6112D	35406	25MHz-2GHz	Mar. 22, 2017	Mar. 26, 2017~ May 04, 2017	Mar 21, 2018	Radiation (03CH03-KS)
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-1356	1GHz~18GHz	Mar. 22, 2017	Mar. 26, 2017~ May 04, 2017	Mar 21, 2018	Radiation (03CH03-KS)
SHF-EHF Horn	com-power	AH-840	101070	18GHz ~40GHz	Oct. 19, 2016	Mar. 26, 2017~ May 04, 2017	Oct. 18, 2017	Radiation (03CH03-KS)
Amplifier	com-power	PA-103A	161069	1MHz ~1000MHz / 32 dB	Mar. 18, 2017	Mar. 26, 2017~ May 04, 2017	Mar. 17, 2018	Radiation (03CH03-KS)
Amplifier	MITEQ	TTA1840-35-HG	1887435	18~40GHz	Oct. 13, 2016	Mar. 26, 2017~ May 04, 2017	Oct. 12, 2017	Radiation (03CH03-KS)
high gain Amplifier	MITEQ	AMF-7D-00101800-30-10P	2025788	1Ghz-18Ghz	Mar. 18, 2017	Mar. 26, 2017~ May 04, 2017	Mar. 17, 2018	Radiation (03CH03-KS)
Amplifier	Agilent	8449B	3008A02370	1GHz~26.5GHz	Oct. 13, 2016	Mar. 26, 2017~ May 04, 2017	Oct. 12, 2017	Radiation (03CH03-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Mar. 26, 2017~ May 04, 2017	NCR	Radiation (03CH03-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	Mar. 26, 2017~ May 04, 2017	NCR	Radiation (03CH03-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	Mar. 26, 2017~ May 04, 2017	NCR	Radiation (03CH03-KS)
EMI Receiver	R&S	ESCI7	100768	9kHz~7GHz;	Apr. 20, 2016	Apr. 04, 2017	Apr. 19, 2017	Conduction (CO01-KS)
AC LISN	MessTec	AN3016	060103	9kHz~30MHz	Oct. 13, 2016	Apr. 04, 2017	Oct. 13, 2017	Conduction (CO01-KS)
AC LISN (for auxiliary equipment)	MessTec	AN3016	060105	9kHz~30MHz	Oct. 13, 2016	Apr. 04, 2017	Oct. 13, 2017	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP000000811	AC 0V~300V, 45Hz~1000Hz	Oct. 13, 2016	Apr. 04, 2017	Oct. 13, 2017	Conduction (CO01-KS)
Transient limiter	COM-POWER	LIT-153	531035	150kHz~30MHz	Aug. 26, 2016	Apr. 04, 2017	Aug. 25, 2017	Conduction (CO01-KS)

NCR: No Calibration Required

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))	**4.6dB**

Uncertainty of Radiated Emission Measurement (1GHz ~ 18GHz)

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

Uncertainty of Radiated Emission Measurement (18GHz ~ 40GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**4.7dB**

Appendix A. Conducted Test Results

Report Number : FR731003D

Test Engineer:	Silent Hai	Temperature:	21~25	°C
Test Date:	2017/3/26~2017/3/28	Relative Humidity:	51~55	%

Report Number : FR731003D

TEST RESULTS DATA
26dB and 99% OBW

Band I										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	99% Bandwidth (MHz)	26 dB Bandwidth (MHz)	IC 99% Bandwidth Power Limit (dBm)	IC 99% Bandwidth EIRP Limit (dBm)		
11a	6Mbps	1	36	5180	18.53	23.78	-	22.68		
11a	6Mbps	1	44	5220	18.88	23.68	-	22.76		
11a	6Mbps	1	48	5240	18.63	23.68	-	22.70		
HT20	MCS0	1	36	5180	19.28	24.18	-	22.85		
HT20	MCS0	1	44	5220	19.28	24.03	-	22.85		
HT20	MCS0	1	48	5240	19.53	23.88	-	22.91		
HT40	MCS0	1	38	5190	36.56	45.32	-	23.01		
HT40	MCS0	1	46	5230	36.76	44.69	-	23.01		
VHT80	MCS0	1	42	5210	74.93	83.76	-	23.01		

Report Number : FR731003D

TEST RESULTS DATA
Average Power Table

FCC Band I										
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	36	5180	0.58	11.10	24.00	4.30		Pass
11a	6Mbps	1	44	5220	0.58	10.91	24.00	4.30		Pass
11a	6Mbps	1	48	5240	0.58	11.05	24.00	4.30		Pass
HT20	MCS0	1	36	5180	0.64	11.05	24.00	4.30		Pass
HT20	MCS0	1	44	5220	0.64	10.99	24.00	4.30		Pass
HT20	MCS0	1	48	5240	0.64	11.13	24.00	4.30		Pass
HT40	MCS0	1	38	5190	0.65	10.29	24.00	4.30		Pass
HT40	MCS0	1	46	5230	0.65	10.23	24.00	4.30		Pass
VHT20	MCS0	1	36	5180	0.81	10.27	24.00	4.30		Pass
VHT20	MCS0	1	44	5220	0.81	10.08	24.00	4.30		Pass
VHT20	MCS0	1	48	5240	0.81	9.98	24.00	4.30		Pass
VHT40	MCS0	1	38	5190	1.47	9.95	24.00	4.30		Pass
VHT40	MCS0	1	46	5230	1.47	9.98	24.00	4.30		Pass
VHT80	MCS0	1	42	5210	2.58	9.82	24.00	4.30		Pass

IC Band I										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)	IC Conducted Power Limit (dBm)	DG (dBi)	IC EIRP Power Limit (dBm)	Pass/Fail
11a	6Mbps	1	36	5180	0.58	11.10	18.38	4.30	22.68	Pass
11a	6Mbps	1	44	5220	0.58	10.91	18.46	4.30	22.76	Pass
11a	6Mbps	1	48	5240	0.58	11.05	18.40	4.30	22.70	Pass
HT20	MCS0	1	36	5180	0.64	11.05	18.55	4.30	22.85	Pass
HT20	MCS0	1	44	5220	0.64	10.99	18.55	4.30	22.85	Pass
HT20	MCS0	1	48	5240	0.64	11.13	18.61	4.30	22.91	Pass
HT40	MCS0	1	38	5190	0.65	10.29	18.71	4.30	23.01	Pass
HT40	MCS0	1	46	5230	0.65	10.23	18.71	4.30	23.01	Pass
VHT20	MCS0	1	36	5180	0.81	10.27	18.71	4.30	23.01	Pass
VHT20	MCS0	1	44	5220	0.81	10.08	18.71	4.30	23.01	Pass
VHT20	MCS0	1	48	5240	0.81	9.98	18.71	4.30	23.01	Pass
VHT40	MCS0	1	38	5190	1.47	9.95	18.71	4.30	23.01	Pass
VHT40	MCS0	1	46	5230	1.47	9.98	18.71	4.30	23.01	Pass
VHT80	MCS0	1	42	5210	2.58	9.82	18.71	4.30	23.01	Pass

TEST RESULTS DATA
Power Spectral Density

FCC Band I										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	Average Power Density (dBm/MHz)	Average PSD Limit (dBm/MHz)	DG (dBi)	-	Pass/Fail
11a	6Mbps	1	36	5180	0.58	-1.18	11.00	4.30		Pass
11a	6Mbps	1	44	5220	0.58	-0.98	11.00	4.30		Pass
11a	6Mbps	1	48	5240	0.58	-0.32	11.00	4.30		Pass
HT20	MCS0	1	36	5180	0.64	-0.83	11.00	4.30		Pass
HT20	MCS0	1	44	5220	0.64	-1.17	11.00	4.30		Pass
HT20	MCS0	1	48	5240	0.64	-0.57	11.00	4.30		Pass
HT40	MCS0	1	38	5190	0.65	-3.95	11.00	4.30		Pass
HT40	MCS0	1	46	5230	0.65	-3.75	11.00	4.30		Pass
VHT80	MCS0	1	42	5210	2.58	-3.62	11.00	4.30		Pass

IC Band I										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	Average Power Density (dBm/MHz)	Average PSD Limit (dBm/MHz)	DG (dBi)	IC EIRP PSD Limit (dBm/MHz)	Pass/Fail
11a	6Mbps	1	36	5180	0.58	-1.18	5.70	4.30	10	Pass
11a	6Mbps	1	44	5220	0.58	-0.98	5.70	4.30	10	Pass
11a	6Mbps	1	48	5240	0.58	-0.32	5.70	4.30	10	Pass
HT20	MCS0	1	36	5180	0.64	-0.83	5.70	4.30	10	Pass
HT20	MCS0	1	44	5220	0.64	-1.17	5.70	4.30	10	Pass
HT20	MCS0	1	48	5240	0.64	-0.57	5.70	4.30	10	Pass
HT40	MCS0	1	38	5190	0.65	-3.95	5.70	4.30	10	Pass
HT40	MCS0	1	46	5230	0.65	-3.75	5.70	4.30	10	Pass
VHT80	MCS0	1	42	5210	2.58	-3.62	5.70	4.30	10	Pass

TEST RESULTS DATA
Frequency Stability

Band I										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Center Frequency (MHz)	Frequency Deviation (MHz)	Frequency Stablility (ppm)	Temperature (°C)	Voltage (V)	Note
11a	6Mbps	1	36	5180	5180.025	0.025	4.83	50	3.85	
11a	6Mbps	1	36	5180	5179.975	-0.025	-4.83	-30	3.85	
11a	6Mbps	1	36	5180	5179.975	-0.025	-4.83	20	4.4	
11a	6Mbps	1	36	5180	5179.975	-0.025	-4.83	20	3.6	
11a	6Mbps	1	36	5180	5179.975	-0.025	-4.83	20	3.85	

Appendix B. Radiated Spurious Emission

Band 1 - 5150~5250MHz

WIFI 802.11a (Band Edge @ 3m)

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
1		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11a CH 36 5180MHz		5149.12	60	-14.00	74	57.25	31.36	7.92	36.53	382	227	P	H
		5149.99	43.38	-10.62	54	40.63	31.36	7.92	36.53	382	227	A	H
	*	5184	99.8	-	-	97.03	31.35	7.94	36.52	382	227	P	H
	*	5184	93.02	-	-	90.25	31.35	7.94	36.52	382	227	A	H
		5144.32	57.48	-16.52	74	54.73	31.36	7.92	36.53	352	360	P	V
		5149.6	42.96	-11.04	54	40.21	31.36	7.92	36.53	352	360	A	V
	*	5186	99.03	-	-	96.26	31.35	7.94	36.52	352	360	P	V
	*	5186	91.61	-	-	88.84	31.35	7.94	36.52	352	360	A	V
802.11a CH 44 5220MHz		5140.8	45.41	-28.59	74	42.66	31.36	7.92	36.53	400	226	P	H
		5111.2	35.85	-18.15	54	33.12	31.37	7.91	36.55	400	226	A	H
	*	5218	100.27	-	-	97.44	31.34	7.99	36.5	400	226	P	H
	*	5218	93.72	-	-	90.89	31.34	7.99	36.5	400	226	A	H
		5374.8	44.44	-29.56	74	41.18	31.29	8.39	36.42	400	226	P	H
		5384.88	35.11	-18.89	54	31.82	31.28	8.43	36.42	400	226	A	H
		5112.16	44.85	-29.15	74	42.12	31.37	7.91	36.55	316	360	P	V
		5110.08	35.77	-18.23	54	33.04	31.37	7.91	36.55	316	360	A	V
	*	5216	95.92	-	-	93.09	31.34	7.99	36.5	316	360	P	V
	*	5216	88.52	-	-	85.69	31.34	7.99	36.5	316	360	A	V
		5391.72	43.76	-30.24	74	40.47	31.28	8.43	36.42	316	360	P	V
		5399.1	34.94	-19.06	54	31.59	31.28	8.48	36.41	316	360	A	V

802.11a CH 48 5240MHz	*	5236	100.46	-	-	97.58	31.33	8.04	36.49	400	227	P	H
	*	5236	93.17	-	-	90.29	31.33	8.04	36.49	400	227	A	H
		5381.28	43.98	-30.02	74	40.69	31.28	8.43	36.42	400	227	P	H
		5389.2	35.27	-18.73	54	31.98	31.28	8.43	36.42	400	227	A	H
	*	5236	96.4	-	-	93.52	31.33	8.04	36.49	274	360	P	V
	*	5236	88.9	-	-	86.02	31.33	8.04	36.49	274	360	A	V
		5383.98	44.2	-29.80	74	40.91	31.28	8.43	36.42	274	360	P	V
		5391.54	35.1	-18.90	54	31.81	31.28	8.43	36.42	274	360	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 1 5150~5250MHz

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 36 5180MHz		10360	56.07	-17.93	74	63.06	37.15	11.84	55.98	100	325	P	H
		10360	44.61	-9.39	54	51.6	37.15	11.84	55.98	100	325	A	H
		10360	59.4	-14.60	74	66.39	37.15	11.84	55.98	100	267	P	V
		10360	46.41	-7.59	54	53.4	37.15	11.84	55.98	100	267	A	V
802.11a CH 44 5220MHz		10440	58.9	-15.10	74	65.73	37.29	11.89	56.01	124	343	P	H
		10440	46.64	-7.36	54	53.47	37.29	11.89	56.01	124	343	A	H
		10440	57.07	-16.93	74	63.9	37.29	11.89	56.01	100	270	P	V
		10440	46.36	-7.64	54	53.19	37.29	11.89	56.01	100	270	A	V
802.11a CH 48 5240MHz		10480	55.59	-18.41	74	62.32	37.39	11.92	56.04	100	345	P	H
		10480	46.05	-7.95	54	52.78	37.39	11.92	56.04	100	345	A	H
		10480	53.94	-20.06	74	60.67	37.39	11.92	56.04	100	248	P	V
		10480	44.75	-9.25	54	51.48	37.39	11.92	56.04	100	248	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 1 5150~5250MHz

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)
		5149.76	61.03	-12.97	74	58.28	31.36	7.92	36.53	100	218	P	H
		5148.48	42.6	-11.40	54	39.85	31.36	7.92	36.53	100	218	A	H
802.11n	*	5186	97.55	-	-	94.78	31.35	7.94	36.52	100	218	P	H
HT20	*	5186	90.47	-	-	87.7	31.35	7.94	36.52	100	218	A	H
CH 36		5144	56.55	-17.45	74	53.8	31.36	7.92	36.53	100	163	P	V
5180MHz		5149.76	44.17	-9.83	54	41.42	31.36	7.92	36.53	100	163	A	V
	*	5172	97.31	-	-	94.55	31.35	7.93	36.52	100	163	P	V
	*	5172	90.05	-	-	87.29	31.35	7.93	36.52	100	163	A	V
		5110.08	45.18	-28.82	74	42.45	31.37	7.91	36.55	100	218	P	H
		5118.4	35.77	-18.23	54	33.04	31.37	7.91	36.55	100	218	A	H
	*	5226	97.75	-	-	94.87	31.33	8.04	36.49	100	218	P	H
	*	5226	90.57	-	-	87.69	31.33	8.04	36.49	100	218	A	H
802.11n		5373.18	43.84	-30.16	74	40.58	31.29	8.39	36.42	100	218	P	H
HT20		5394.6	34.98	-19.02	54	31.63	31.28	8.48	36.41	100	218	A	H
CH 44		5135.52	45.1	-28.90	74	42.37	31.36	7.91	36.54	100	173	P	V
5220MHz		5102.08	35.8	-18.20	54	33.09	31.37	7.9	36.56	100	173	A	V
	*	5216	97.45	-	-	94.62	31.34	7.99	36.5	100	173	P	V
	*	5216	90.25	-	-	87.42	31.34	7.99	36.5	100	173	A	V
		5356.98	43.29	-30.71	74	40.09	31.29	8.34	36.43	100	173	P	V
		5386.68	35.1	-18.90	54	31.81	31.28	8.43	36.42	100	173	A	V

		5389.74	43.63	-30.37	74	40.34	31.28	8.43	36.42	298	233	P	H
		5391.54	35.16	-18.84	54	31.87	31.28	8.43	36.42	298	233	A	H
802.11n	*	5236	98.78	-	-	95.9	31.33	8.04	36.49	298	233	P	H
HT20	*	5236	90.59	-	-	87.71	31.33	8.04	36.49	298	233	A	H
CH 48		5361.3	44.71	-29.29	74	41.45	31.29	8.39	36.42	118	177	P	V
5240MHz		5388.12	35.18	-18.82	54	31.89	31.28	8.43	36.42	118	177	A	V
	*	5234	97.11	-	-	94.23	31.33	8.04	36.49	118	177	P	V
	*	5234	89.69	-	-	86.81	31.33	8.04	36.49	118	177	A	V

Remark

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

Band 1 5150~5250MHz

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		10360	54.13	-19.87	74	61.12	37.15	11.84	55.98	100	35	P	H
HT20		10360	43.48	-10.52	54	50.47	37.15	11.84	55.98	100	35	A	H
CH 36		10360	57.05	-16.95	74	64.04	37.15	11.84	55.98	100	330	P	V
5180MHz		10360	46.35	-7.65	54	53.34	37.15	11.84	55.98	100	330	A	V
802.11n		10440	54.02	-19.98	74	60.85	37.29	11.89	56.01	100	25	P	H
HT20		10440	43.62	-10.38	54	50.45	37.29	11.89	56.01	100	25	A	H
CH 44		10440	56.37	-17.63	74	63.2	37.29	11.89	56.01	100	336	P	V
5220MHz		10440	46.45	-7.55	54	53.28	37.29	11.89	56.01	100	336	A	V
802.11n		10480	51.85	-22.15	74	58.58	37.39	11.92	56.04	100	42	P	H
HT20		10480	43.14	-10.86	54	49.87	37.39	11.92	56.04	100	42	A	H
CH 48		10480	57.2	-16.80	74	63.93	37.39	11.92	56.04	100	335	P	V
5240MHz		10480	45.76	-8.24	54	52.49	37.39	11.92	56.04	100	335	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 1 5150~5250MHz

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)
		5144.8	63.71	-10.29	74	60.96	31.36	7.92	36.53	338	43	P	H
	!	5149.99	52.55	-1.45	54	49.8	31.36	7.92	36.53	338	43	P	H
	*	5200	95.44	-	-	92.66	31.34	7.95	36.51	338	43	P	H
	*	5200	85.57	-	-	82.79	31.34	7.95	36.51	338	43	A	H
802.11n		5387.04	44.41	-29.59	74	41.12	31.28	8.43	36.42	338	43	P	H
HT40		5391.18	35.25	-18.75	54	31.96	31.28	8.43	36.42	338	43	A	H
CH 38		5148	59.68	-14.32	74	56.93	31.36	7.92	36.53	313	282	P	V
5190MHz		5149.76	47.71	-6.29	54	44.96	31.36	7.92	36.53	313	282	A	V
	*	5198	92.34	-	-	89.56	31.34	7.95	36.51	313	282	P	V
	*	5198	84.93	-	-	82.15	31.34	7.95	36.51	313	282	A	V
		5394.6	43.92	-30.08	74	40.57	31.28	8.48	36.41	313	282	P	V
		5399.64	35.09	-18.91	54	31.74	31.28	8.48	36.41	313	282	A	V
		5145.92	50.1	-23.90	74	47.35	31.36	7.92	36.53	347	44	P	H
		5150	39.05	-14.95	54	36.3	31.36	7.92	36.53	347	44	A	H
	*	5222	97.35	-	-	94.52	31.34	7.99	36.5	347	44	P	H
	*	5222	89.91	-	-	87.08	31.34	7.99	36.5	347	44	A	H
802.11n		5367.24	43.69	-30.31	74	40.43	31.29	8.39	36.42	347	44	P	H
HT40		5385.96	34.95	-19.05	54	31.66	31.28	8.43	36.42	347	44	A	H
CH 46		5145.44	46.91	-27.09	74	44.16	31.36	7.92	36.53	341	188	P	V
5230MHz		5149.92	37.25	-16.75	54	34.5	31.36	7.92	36.53	341	188	A	V
	*	5240	95.49	-	-	92.61	31.33	8.04	36.49	341	188	P	V
	*	5240	88.2	-	-	85.32	31.33	8.04	36.49	341	188	A	V
		5384.34	44.33	-29.67	74	41.04	31.28	8.43	36.42	341	188	P	V
		5384.7	35.04	-18.96	54	31.75	31.28	8.43	36.42	341	188	A	V

Remark

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

Band 1 5150~5250MHz

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 38 5190MHz		10380	48.2	-25.80	74	55.15	37.19	11.85	55.99	100	360	P	H
		10380	49.5	-24.50	74	56.45	37.19	11.85	55.99	100	360	P	V
802.11n HT40 CH 46 5230MHz		10460	52.53	-21.47	74	59.33	37.32	11.9	56.02	100	175	P	H
		10460	42.76	-11.24	54	49.56	37.32	11.9	56.02	100	175	A	H
		10460	48.83	-25.17	74	55.63	37.32	11.9	56.02	100	360	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 1 5150~5250MHz

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)
		5126.08	60.63	-13.37	74	57.9	31.36	7.91	36.54	342	46	P	H
	!	5147.2	52.95	-1.05	54	50.2	31.36	7.92	36.53	342	46	A	H
	*	5224	93.21	-	-	90.38	31.34	7.99	36.5	342	46	P	H
	*	5224	84.3	-	-	81.47	31.34	7.99	36.5	342	46	A	H
802.11ac		5367.42	43.78	-30.22	74	40.52	31.29	8.39	36.42	342	46	P	H
VHT80		5352.48	37.02	-16.98	54	33.82	31.29	8.34	36.43	342	46	A	H
CH 42		5121.44	56.3	-17.70	74	53.57	31.37	7.91	36.55	360	169	P	V
5210MHz		5147.2	45.87	-8.13	54	43.12	31.36	7.92	36.53	360	169	A	V
	*	5184	89.9	-	-	87.13	31.35	7.94	36.52	360	169	P	V
	*	5184	82.94	-	-	80.17	31.35	7.94	36.52	360	169	A	V
		5393.16	43.91	-30.09	74	40.62	31.28	8.43	36.42	360	169	P	V
		5388.12	36.59	-17.41	54	33.3	31.28	8.43	36.42	360	169	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 1 5150~5250MHz

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 42 5210MHz		10420	42.58	-31.42	74	49.44	37.26	11.88	56	100	360	P	H
		10420	42.6	-31.40	74	49.46	37.26	11.88	56	100	360	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 1 5150~5250MHz

Emission below 1GHz

WIFI 802.11n VHT80 (LF @ 3m)

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
1		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11n VHT80 LF		37.76	26.73	-13.27	40	33.83	23.52	0.74	31.36	-	-	P	H
		54.25	30.28	-9.72	40	45.69	15.1	0.89	31.4	150	10	P	H
		103.72	27.59	-15.91	43.5	38.99	18.82	1.23	31.45	-	-	P	H
		225.94	33.37	-12.63	46	46.63	16.48	1.73	31.47	-	-	P	H
		414.12	27.2	-18.80	46	32.1	23.83	2.52	31.25	-	-	P	H
		835.1	31.74	-14.26	46	30.3	28.68	3.68	30.92	-	-	P	H
		34.85	30.31	-9.69	40	35.45	25.5	0.71	31.35	-	-	P	V
		55.22	31.61	-8.39	40	47.22	14.9	0.89	31.4	100	0	P	V
		198.78	30.73	-12.77	43.5	44.66	15.84	1.72	31.49	-	-	P	V
		323.91	28.57	-17.43	46	37.53	20.13	2.21	31.3	-	-	P	V
		458.74	26.99	-19.01	46	30.45	25.11	2.67	31.24	-	-	P	V
		779.81	31.62	-14.38	46	31.45	27.65	3.54	31.02	-	-	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)

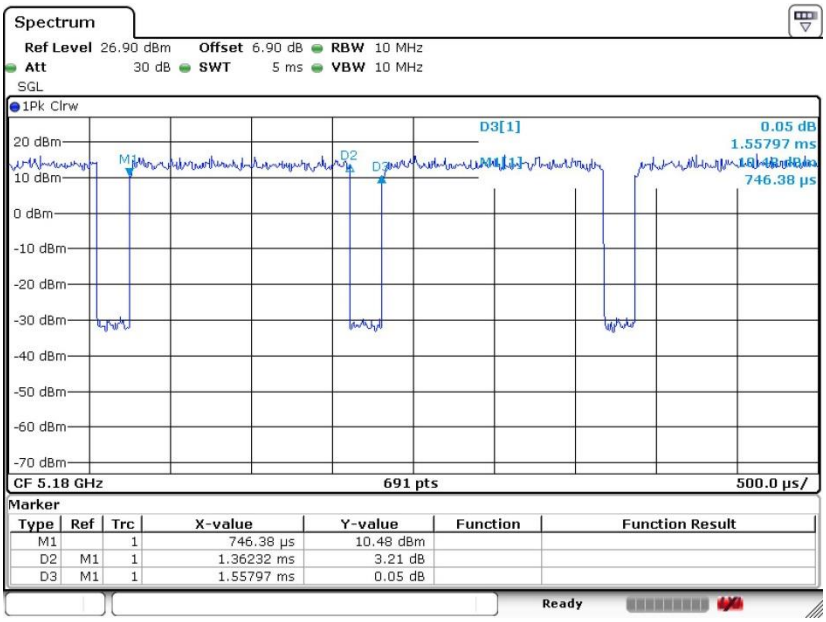
= -10.46(dB)

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

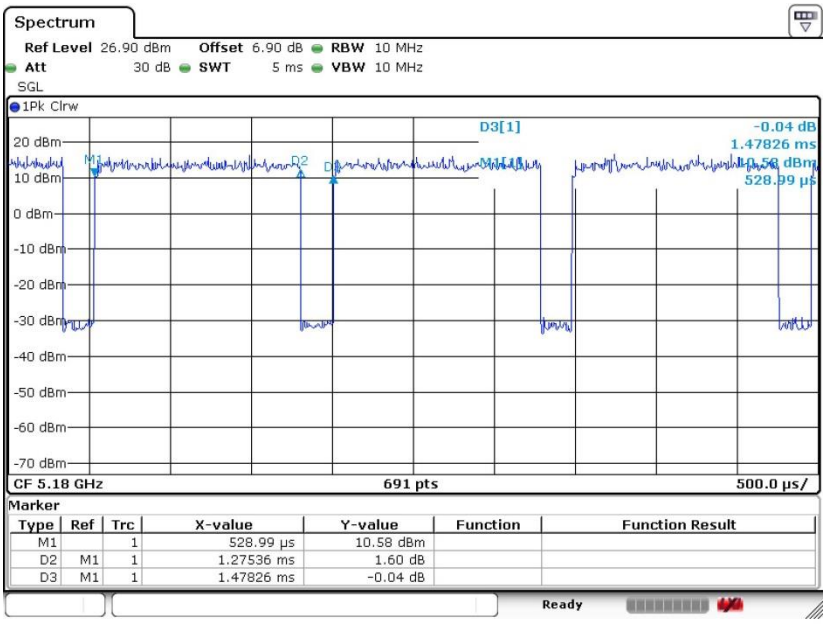
Appendix C. Duty Cycle Plots

Band	Duty Cycle(%)	T(ms)	1/T(kHz)	VBW Setting
802.11a	87.44	1.362	0.734	1kHz
802.11n HT20	86.27	1.275	0.784	1kHz
802.11n HT40	86.08	1.228	0.815	1kHz
802.11ac VHT80	55.16	0.248	4.035	10kHz

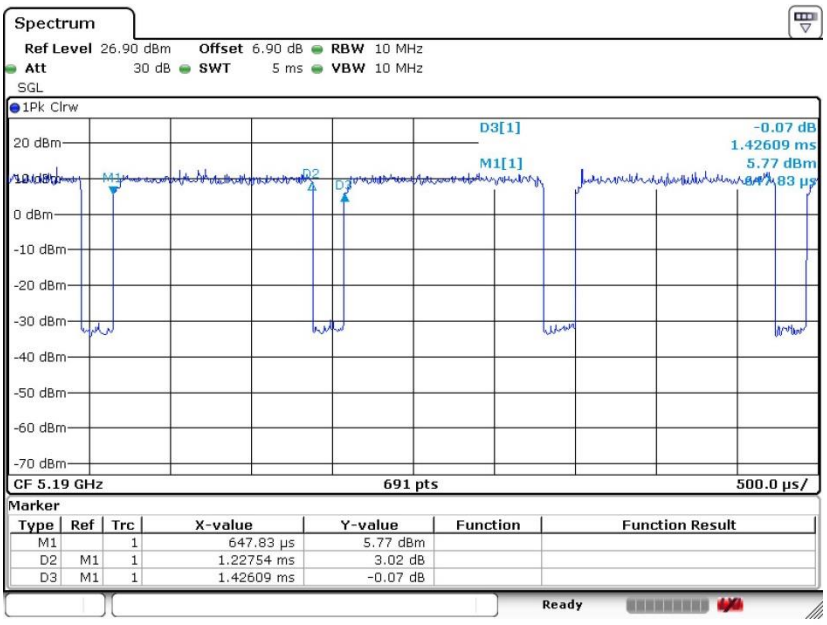
802.11a



802.11n HT20



802.11n HT40



802.11ac VHT80