FCC TEST REPORT

For

Shenzhen Geniatech Inc., Ltd.

eyetv

Model No.: Netstream Air

Additional Model No.: Netstream Duo, Netstream 4S, Netstream 4A, Netstream 4T, Netstream A, Eyetv Netstream, eyetv T2, U6

Prepared for	:	Shenzhen Geniatech Inc., Ltd.
Address	:	18F, GDC Building, No 9th, Gaoxin Middle 3rd Road, Nanshan, Shenzhen, China
Prepared by	:	Shenzhen LCS Compliance Testing Laboratory Ltd.
Address	:	1F., Xingyuan Industrial Park, Tongda Road, Bao'an Blvd., Bao'an District, Shenzhen, Guangdong, China
Tel	:	(+86)755-82591330
Fax	:	(+86)755-82591332
Web	:	www.LCS-cert.com
Mail	:	webmaster@LCS-cert.com
Date of receipt of test sample	:	April 21, 2017
Number of tested samples	:	1
Serial number	:	Prototype
Date of Test	:	April 21, 2017~May 04, 2017
Date of Report	:	May 04, 2017

This report shall not be reproduced except in full, without the written approval of Shenzhen LCS Compliance Testing Laboratory Ltd.

FCC TEST REPORT
FCC CFR 47 PART 15 E(15.407): 2015

Report Reference No.	**:**	**LCS170421079AE**
Date of Issue	:	May 04, 2017
Testing Laboratory Name	**:**	**Shenzhen LCS Compliance Testing Laboratory Ltd.**
Address	:	1F., Xingyuan Industrial Park, Tongda Road, Bao'an Blvd., Bao'an District, Shenzhen, Guangdong, China
Testing Location/ Procedure	:	Full application of Harmonised standards ■ Partial application of Harmonised standards □ Other standard testing method □
Applicant's Name	**:**	**Shenzhen Geniatech Inc., Ltd.**
Address	:	18F, GDC Building, No 9th, Gaoxin Middle 3rd Road, Nanshan, Shenzhen, China
Test Specification		
Standard	:	FCC CFR 47 PART 15 E(15.407): 2015
Test Report Form No.	**:**	LCSEMC-1.0
TRF Originator	:	Shenzhen LCS Compliance Testing Laboratory Ltd.
Master TRF	:	Dated 2011-03

Shenzhen LCS Compliance Testing Laboratory Ltd. All rights reserved.
This publication may be reproduced in whole or in part for non-commercial purposes as long as the Shenzhen LCS Compliance Testing Laboratory Ltd. is acknowledged as copyright owner and source of the material. Shenzhen LCS Compliance Testing Laboratory Ltd. takes no responsibility for and will not assume liability for damages resulting from the reader's interpretation of the reproduced material due to its placement and context.

EUT Description.	**:**	**eyetv**
Trade Mark.....	:	N/A
Model/ Type reference	:	Netstream Air
Ratings.....	:	DC 5.0V/2A by AC Adapter
Result	:	**Positive**

Compiled by:	**Supervised by:**	**Approved by:**
Aking Jin		Gavin Liang
Aking Jin Su/ File administrators	Glin Lu/ Technique principal	Gavin Liang/ Manager

FCC -- TEST REPORT

Test Report No. : LCS170421079AE	May 04, 2017 Date of issue

EUT.....	: eyetv
Type / Model.....	: Netstream Air
Applicant.....	**: Shenzhen Geniatech Inc., Ltd.**
Address.....	: 18F, GDC Building, No 9th, Gaoxin Middle 3rd Road, Nanshan, Shenzhen, China
Telephone.....	: /
Fax.....	: /
Manufacturer.....	**: Shenzhen Geniatech Inc., Ltd.**
Address.....	: 18F, GDC Building, No 9th, Gaoxin Middle 3rd Road, Nanshan, Shenzhen, China
Telephone.....	: /
Fax.....	: /
Factory.....	**: Shenzhen Geniatech Inc., Ltd.**
Address.....	: 18F, GDC Building, No 9th, Gaoxin Middle 3rd Road, Nanshan, Shenzhen, China
Telephone.....	: /
Fax.....	: /

Test Result:	**Positive**

The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

Revision History

Revision	Issue Date	Revisions	Revised By
00	May 04, 2017	Initial Issue	Gavin Liang

This report shall not be reproduced except in full, without the written approval of Shenzhen LCS Compliance Testing Laboratory Ltd.

TABLE OF CONTENTS

1. GENERAL INFORMATION 6
1.1. DESCRIPTION OF DEVICE (EUT) 6
1.2. HOST SYSTEM CONFIGURATION LIST AND DETAILS 6
1.3. EXTERNAL I/O PORT 7
1.4. DESCRIPTION OF TEST FACILITY 7
1.5. STATEMENT OF THE MEASUREMENT UNCERTAINTY 7
1.6. MEASUREMENT UNCERTAINTY 7
1.7. DESCRIPTION OF TEST MODES 7
1.8. FREQUENCY OF CHANNELS 8
2. TEST METHODOLOGY 9
2.1. EUT CONFIGURATION 9
2.2. EUT EXERCISE 9
2.3. GENERAL TEST PROCEDURES 9
3. SYSTEM TEST CONFIGURATION 10
4. SUMMARY OF TEST RESULTS 11
5. TEST RESULT 12
5.1. ON TIME AND DUTY CYCLE 12
5.2. MAXIMUM CONDUCTED OUTPUT POWER MEASUREMENT 14
5.3. POWER SPECTRAL DENSITY MEASUREMENT 16
5.4. 6DB OCCUPIED BANDWIDTH MEASUREMENT 23
5.5. RADIATED EMISSIONS MEASUREMENT 30
5.6. POWER LINE CONDUCTED EMISSIONS 43
5.7 UNDESIRABLE EMISSIONS MEASUREMENT 46
5.8. ANTENNA REQUIREMENTS 56
6. LIST OF MEASURING EQUIPMENTS 57
7. TEST SETUP PHOTOGRAPHS OF EUT 58
8. EXTERIOR PHOTOGRAPHS OF THE EUT 58
9. INTERIOR PHOTOGRAPHS OF THE EUT 58

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

EUT	:	eyetv
Model Number	:	Netstream Air, Netstream Duo, Netstream 4S, Netstream 4A, Netstream 4T, Netstream A, Eyetv Netstream, eyetv T2, U6
Model Declaration	:	PCB board, structure and internal of these model(s) are the same, So no additional models were tested
Test Model	:	Netstream Air
Power Supply	:	DC 5.0V/2A by AC Adapter
Frequency Range	:	IEEE 802.11b:2412-2462MHz IEEE 802.11g:2412-2462MHz IEEE 802.11n HT20:2412-2462MHz/5180-5240MHz/5745-5825MHz IEEE 802.11n HT40:2422-2452MHz/5190-5230MHz/5755-5795MHz IEEE 802.11a:5180-5240MHz/5745-5825MHz IEEE 802.11ac:5180-5240MHz/5745-5825MHz IEEE 802.11ac VHT40: 5190-5230MHz/5755-5795MHz IEEE 802.11ac VHT80: 5210MHz/5775MHz
Channel Number	:	11 Channels for WIFI 20MHz Bandwidth(802.11b/g/n-HT20) 7 Channels for WIFI 40MHz Bandwidth(802.11n-HT40) 4 Channels for 5180.00-5240.00MHz(802.11a/ac/n-HT20) 2 Channels for 5190.00-5230.00MHz(802.11ac/n-HT40) 1 Channels for 5210.00MHz(802.11ac-HT80) 5 Channels for 5745.00-5825.00MHz(802.11a/ac/n-HT20) 2 Channels for 5755.00-5795.00MHz(802.11ac/n-HT40) 1 Channels for 5775.00MHz(802.11ac-HT80)
Modulation Technology	:	IEEE 802.11b: DSSS(CCK,DQPSK,DBPSK) IEEE 802.11g: OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n: OFDM (64QAM, 16QAM,QPSK,BPSK) IEEE 802.11a: OFDM (64QAM, 16QAM,QPSK,BPSK) IEEE 802.11ac: OFDM (256QAM, 64QAM, 16QAM,QPSK,BPSK)
Data Rates	:	IEEE 802.11b: 1-11Mbps IEEE 802.11g: 6-54Mbps IEEE 802.11n: MCS0-MCS15 IEEE 802.11a: 6-54Mbps IEEE 802.11ac: MCS0-MCS15
Antenna Type And Gain	:	PIFA antenna, 2.0dBi (Max.) for 2.4G, 5.2G and 5.8G WLAN

1.2. Host System Configuration List and Details

Manufacturer	Description	Model	Serial Number	Certificate
TRANSIN	Adapter	TS-A010-050020ADH	--	VoC

1.3. External I/O Port

I/O Port Description	Quantity	Cable
DC Power Port	1	N/A
ATSC Antenna Port	1	N/A

1.4. Description of Test Facility

CNAS Registration Number. is L4595.

FCC Registration Number. is 899208.

Industry Canada Registration Number. is 9642A-1.

VCCI Registration Number. is C-4260 and R-3804.

ESMD Registration Number. is ARCB0108.

UL Registration Number. is 100571-492.

TUV SUD Registration Number. is SCN1081.

TUV RH Registration Number. is UA 50296516-001

The 3m-Semi anechoic test site fulfils CISPR 16-1-4 according to ANSI C63.4:2014 and CISPR 16-1-4:2010 SVSWR requirement for radiated emission above 1GHz.

1.5. Statement of the Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. To CISPR 16 – 4 “Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements” and is documented in the LCS quality system acc. To DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

1.6. Measurement Uncertainty

Test Item		Frequency Range	Uncertainty	Note
Radiation Uncertainty	:	9KHz~30MHz	3.10dB	(1)
		30MHz~200MHz	2.96dB	(1)
		200MHz~1000MHz	3.10dB	(1)
		1GHz~26.5GHz	3.80dB	(1)
		26.5GHz~40GHz	3.90dB	(1)
Conduction Uncertainty	:	150kHz~30MHz	1.63dB	(1)
Power disturbance	:	30MHz~300MHz	1.60dB	(1)

(1). This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

1.7. Description of Test Modes

The EUT has been tested under operating condition.

This test was performed with EUT in X, Y, Z position and the worst case was found when EUT in X position.

Worst-case mode and channel used for 150 kHz-30 MHz power line conducted emissions was the mode and channel with the highest output power that was determined to be IEEE 802.11a mode (High Channel).

Worst-case mode and channel used for 9kHz-1000 MHz radiated emissions was the mode and channel with the highest output power, that was determined to be IEEE 802.11a mode(High Channel).

Worst-Case data rates were utilized from preliminary testing of the Chipset, worst-case data rates used during the testing are as follows:

IEEE 802.11a Mode : 6 Mbps, OFDM.
IEEE 802.11ac VHT20 Mode: MCS0
IEEE 802.11n HT20 Mode: MCS0, OFDM.
IEEE 802.11ac VHT40 Mode: MCS0, OFDM.
IEEE 802.11n HT40 Mode: MCS0, OFDM.
IEEE 802.11ac VHT80 Mode: MCS0, OFDM.

Antenna & Bandwidth

Antenna	Single (Port.1)			Two (Port.1 + Port.2)		
Bandwidth Mode	20MHz	40MHz	80MHz	20MHz	40MHz	80MHz
IEEE 802.11a	☐	☐	☐	☑	☐	☐
IEEE 802.11n	☐	☐	☐	☑	☑	☐
IEEE 802.11ac	☐	☐	☐	☑	☑	☑

1.8. Frequency of Channels

IEEE 802.11a/n-HT20/ac-VHT20

Frequency Band	Channel No.	Frequency(MHz)	Channel No.	Frequency(MHz)
5745~5825MHz	149	5745	161	5805
	153	5765	165	5825
	157	5785	---	---

IEEE 802.11n-HT40/ac-VHT40

Frequency Band	Channel No.	Frequency(MHz)	Channel No.	Frequency(MHz)
5755~5795MHz	151	5755	159	5795

IEEE 802.11ac-VHT80

Frequency Band	Channel No.	Frequency(MHz)	Channel No.	Frequency(MHz)
5775MHz	155	5775	--	--

The test configuration of the test software shows as below:

Test mode	Channel No.	Frequency(MHz)	Software setting value
IEEE 802.11a	149	5745	14
	157	5785	14
	165	5825	14
IEEE 802.11n-HT20	149	5745	12
	157	5785	12
	165	5825	12
IEEE 802.11ac-VHT20	149	5745	11
	157	5785	11
	165	5825	11
IEEE 802.11n-HT40	151	5775	12
	159	5795	12
IEEE 802.11ac-VHT40	151	5775	11
	159	5795	11
IEEE 802.11ac-VHT80	155	5775	11

2. TEST METHODOLOGY

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

The radiated testing was performed at an antenna-to-EUT distance of 3 meters. All radiated and conducted emissions measurement was performed at Shenzhen LCS Compliance Testing Laboratory Ltd.

2.1. EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

2.2. EUT Exercise

The EUT was operated in the engineering mode to fix the TX frequency that was for the purpose of the measurements.

According to FCC's request, Test Procedure 789033 D02 General UNII Test Procedures New Rules v01r04 and KDB 662911 are required to be used for this kind of FCC 15.407 UII device.

According to its specifications, the EUT must comply with the requirements of the Section 15.203, 15.205, 15.207, 15.209 and 15.407 under the FCC Rules Part 15 Subpart E

2.3. General Test Procedures

2.3.1 Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 6.2.1 of ANSI C63.10-2013 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using Quasi-peak and average detector modes.

2.3.2 Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 6.3 of ANSI C63.10-2013

3. SYSTEM TEST CONFIGURATION

3.1. Justification

The system was configured for testing in a continuous transmits condition.

3.2. EUT Exercise Software

The system was configured for testing in a continuous transmits condition and change test channels by software (realtek_8812AU) provided by application.

3.3. Special Accessories

N/A

3.4. Block Diagram/Schematics

Please refer to the related document

3.5. Equipment Modifications

Shenzhen LCS Compliance Testing Laboratory Ltd. has not done any modification on the EUT.

3.6. Test Setup

Please refer to the test setup photo.

4. SUMMARY OF TEST RESULTS

Applied Standard: FCC Part 15 Subpart E		
FCC Rules	**Description of Test**	**Result**
§15.407(a)	Maximum Conducted Output Power	Compliant
§15.407(a)	Power Spectral Density	Compliant
§15.407(e)	6dB Bandwidth	Compliant
§15.407(b)	Radiated Emissions	Compliant
§15.407(b)	Band edge Emissions	Compliant
§15.407(g)	Frequency Stability	Note
§15.207(a)	Line Conducted Emissions	Compliant
§15.203	Antenna Requirements	Compliant
§2.1091	RF Exposure	Compliant

Note: The customer declared frequency stability is better than 20ppm which ensures that the signal remains in the allocated bands under all operational conditions stated in the user manual.

5. TEST RESULT

5.1. On Time and Duty Cycle

5.1.1. Standard Applicable

None; for reporting purpose only.

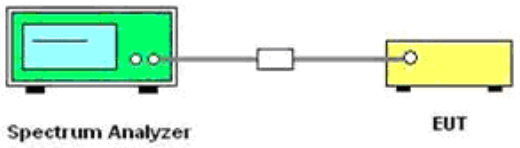
5.1.2. Measuring Instruments and Setting

Please refer to section 6 of equipment list in this report. The following table is the setting of the spectrum analyzer.

5.1.3. Test Procedures

1. Set the Centre frequency of the spectrum analyzer to the transmitting frequency;
2. Set the span=0MHz, RBW=8MHz, VBW=50MHz, Sweep time=5ms;
3. Detector = peak;
4. Trace mode = Single hold.

5.1.4. Test Setup Layout



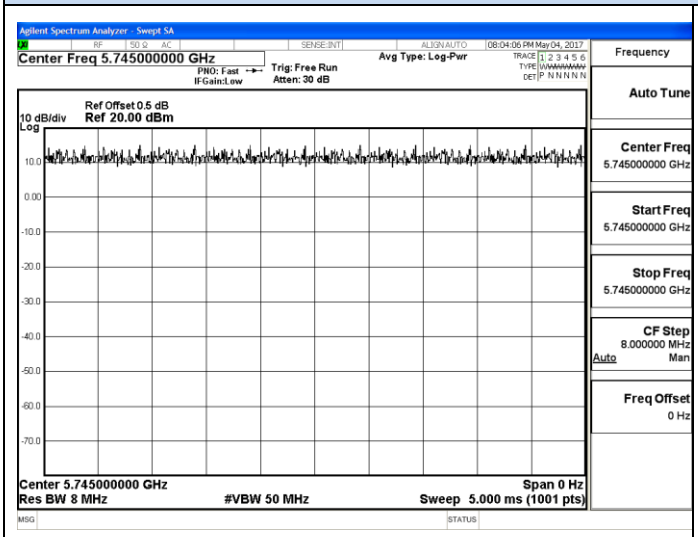
5.1.5. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

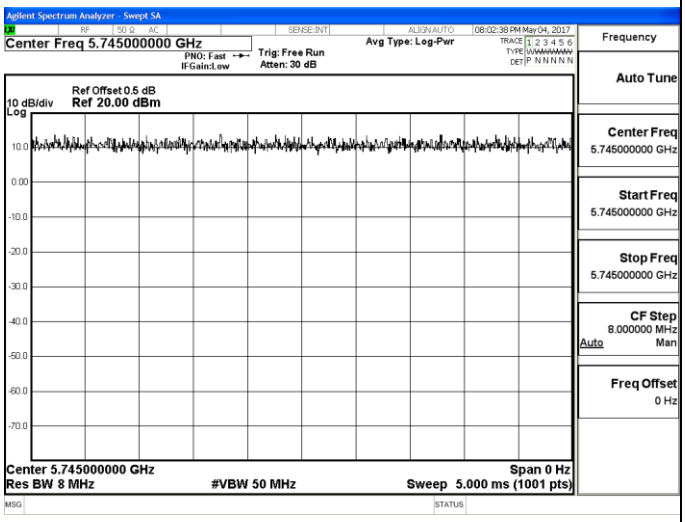
5.1.6. Test result

Mode	On Time B (ms)	Period (ms)	Duty Cycle x (Linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/B Minimum VBW(KHz)
IEEE 802.11a	5.0	5.0	1	100	0	0.01
IEEE 802.11n HT20	5.0	5.0	1	100	0	0.01
IEEE 802.11ac VHT20	5.0	5.0	1	100	0	0.01
IEEE 802.11n HT40	5.0	5.0	1	100	0	0.01
IEEE 802.11ac VHT40	5.0	5.0	1	100	0	0.01
IEEE 802.11ac VHT80	5.0	5.0	1	100	0	0.01

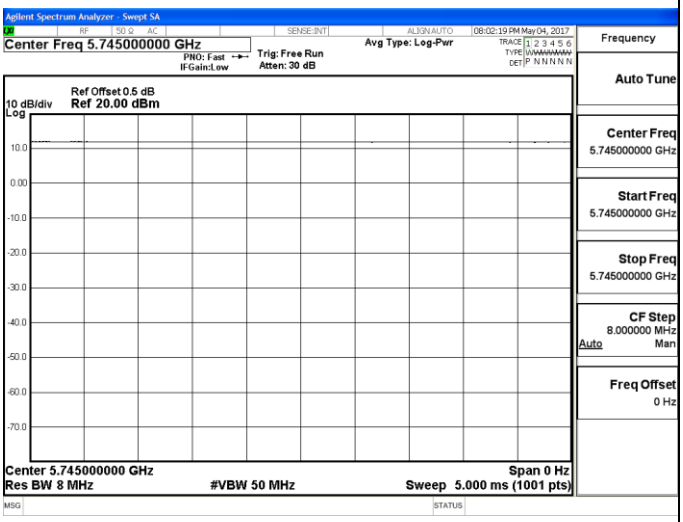
On Time and Duty Cycle



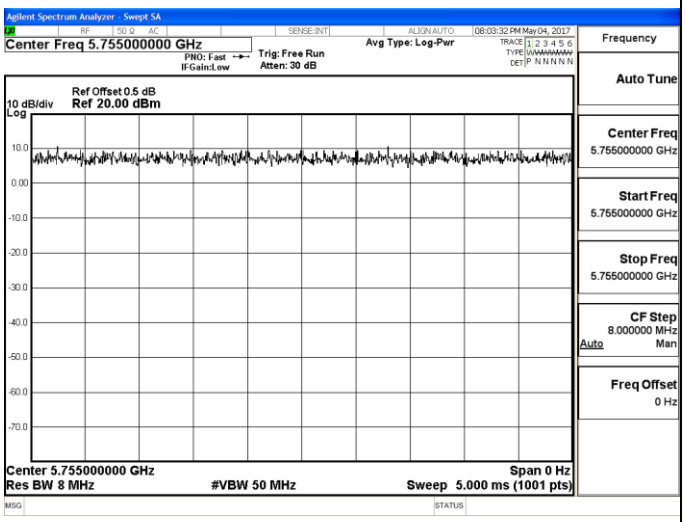
IEEE 802.11a



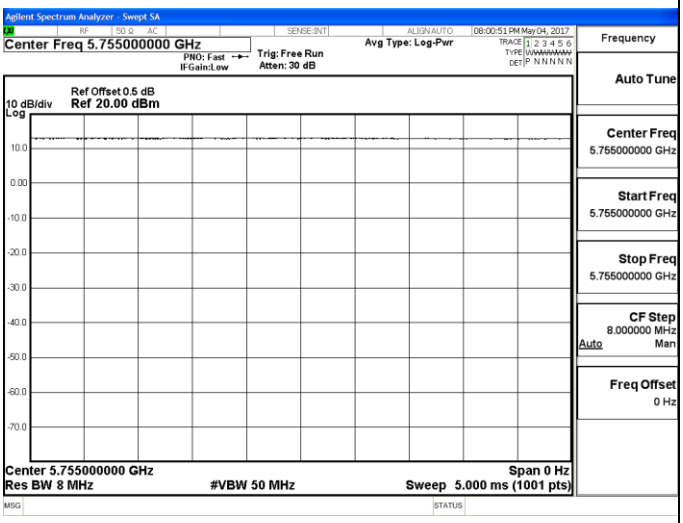
IEEE 802.11n HT20



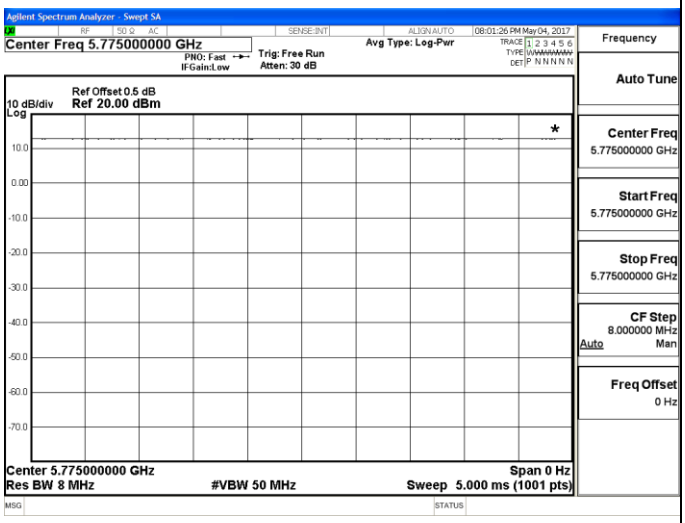
IEEE 802.11ac VHT20



IEEE 802.11n HT40



IEEE 802.11ac VHT40



IEEE 802.11ac VHT80

5.2. Maximum Conducted Output Power Measurement

5.2.1. Standard Applicable

For 5725~5850MHz

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, 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, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

5.2.2. Measuring Instruments and Setting

Please refer to section 6 of equipment list in this report. The following table is the setting of the power meter.

5.2.3. Test Procedures

The transmitter output (antenna port) was connected to the power meter.

According to KDB 789033 D02 Section 3 (a) Method PM (Measurement using an RF average power meter):

(i) Measurements may be performed using a wideband RF power meter with a thermocouple detector or equivalent if all of the conditions listed below are satisfied.

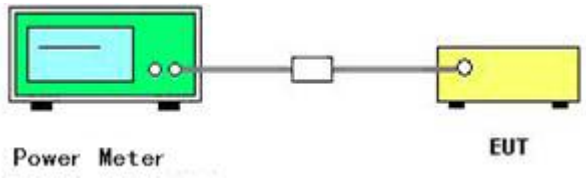
- The EUT is configured to transmit continuously or to transmit with a constant duty cycle.
- At all times when the EUT is transmitting, it must be transmitting at its maximum power control level.
- The integration period of the power meter exceeds the repetition period of the transmitted signal by at least a factor of five.

(ii) If the transmitter does not transmit continuously, measure the duty cycle, x, of the transmitter output signal as described in section II.B.

(iii) Measure the average power of the transmitter. This measurement is an average over both the on and off periods of the transmitter.

(iv) Adjust the measurement in dBm by adding 10 log (1/x) where x is the duty cycle (e.g., 10 log (1/0.25) if the duty cycle is 25%).

5.2.4. Test Setup Layout



5.2.5. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

5.2.6. Test Result of Maximum Conducted Output Power

Temperature	25℃	Humidity	60%
Test Engineer	Aking Jin	Configurations	IEEE 802.11a/n/ac

Test Mode	Channel	Frequency (MHz)	Measured Conducted Average Power (dBm)			Duty Cycle factor (dB)	Report Conducted Average Power (dBm)			Limits (dBm)	Verdict
			Antenna 0	Antenna 1	Sum		Antenna 0	Antenna 1	Sum		
IEEE 802.11a	149	5745	13.78	13.59	/	0.000	13.78	13.59	/	30.00	PASS
	157	5785	13.85	13.84	/	0.000	13.85	13.84	/		
	165	5825	13.79	13.77	/	0.000	13.79	13.77	/		
IEEE 802.11n HT20	149	5745	12.85	12.69	15.78	0.000	12.85	12.69	15.78	30.00	PASS
	157	5785	12.62	12.54	15.59	0.000	12.62	12.54	15.59		
	165	5825	12.48	12.45	15.48	0.000	12.48	12.45	15.48		
IEEE 802.11ac VHT20	149	5745	11.65	11.26	14.47	0.000	11.65	11.26	14.47	30.00	PASS
	157	5785	11.48	11.32	14.41	0.000	11.48	11.32	14.41		
	165	5825	11.74	11.54	14.65	0.000	11.74	11.54	14.65		
IEEE 802.11n HT40	151	5755	10.54	10.44	13.50	0.000	10.54	10.44	13.50	30.00	PASS
	159	5795	10.62	10.87	13.76	0.000	10.62	10.87	13.76		
IEEE 802.11ac VHT40	151	5755	10.59	10.65	13.63	0.000	10.59	10.65	13.63	30.00	PASS
	159	5795	10.85	10.54	13.71	0.000	10.85	10.54	13.71		
IEEE 802.11ac VHT80	155	5775	10.45	10.26	13.37	0.000	10.45	10.26	13.37	30.00	PASS

Remark:

1. *Measured output power at difference data rate for each mode and recorded worst case for each mode.*
2. *Test results including cable loss;*
3. *Worst case data at 6Mbps at IEEE 802.11a; MCS0 at IEEE 802.11n HT20, IEEE 802.11n HT40, IEEE 802.11a VHT20, IEEE 802.11ac VHT40 and IEEE 802.11ac VHT80;*
4. *For MIMO with CCD technology device, The Directional Gain= Gain of individual transmit antennas (dBi) + Array gain;*
   Array gain = 10 log (N_{ant}), where N_{ant} is the number of transmit antennas.
5. *Directional Gain = 2.00 + 10log (2) = 5.01 dBi < 6dBi; no need reduce power limit;*
6. *Report conducted average power = measured conducted average power + Duty Cycle factor;*

5.3. Power Spectral Density Measurement

5.3.1. Standard Applicable

For 5725~5850MHz

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, 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, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

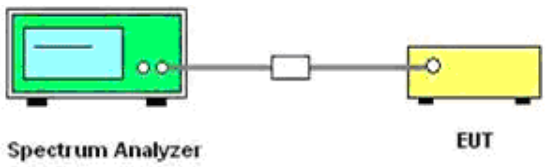
5.3.2. Measuring Instruments and Setting

Please refer to section 6 of equipments list in this report. The following table is the setting of Spectrum Analyzer.

5.3.3. Test Procedures

1. The transmitter was connected directly to a Spectrum Analyzer through a directional couple.
2. The power was monitored at the coupler port with a Spectrum Analyzer. The power level was set to the maximum level.
3. Set the RBW = 300 kHz.
4. Set the VBW ≥ 3*RBW
5. Span=Encompass the entire emissions bandwidth (EBW) of the signal
6. Detector = RMS.
7. Sweep time = auto couple.
8. Trace mode = max hold.
9. Allow trace to fully stabilize.
10. If measurement bandwidth of Maximum PSD is specified in 500 kHz, add 10 log (500 kHz/RBW) to the measured result, whereas RBW (<500 kHz) is the reduced resolution bandwidth of the spectrum analyzer set during measurement.
11. If measurement bandwidth of Maximum PSD is specified in 1 MHz, add 10 log (1MHz/RBW) to the measured result, whereas RBW (< 1 MHz) is the reduced resolution bandwidth of spectrum analyzer set during measurement.
12. Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.

5.3.4. Test Setup Layout



5.3.5. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

5.3.6. Test Result of Power Spectral Density

Temperature	25℃	Humidity	60%
Test Engineer	Aking Jin	Configurations	802.11a/n/ac

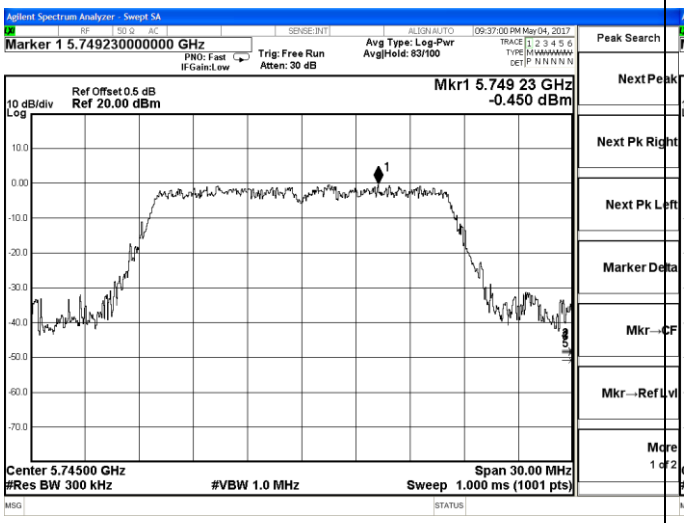
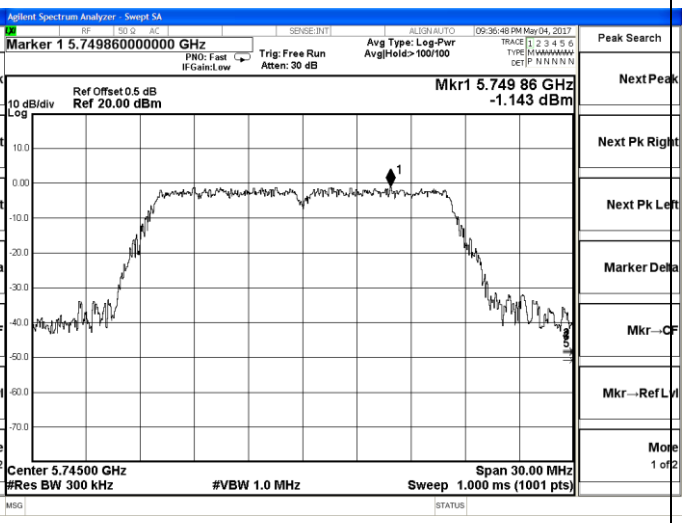
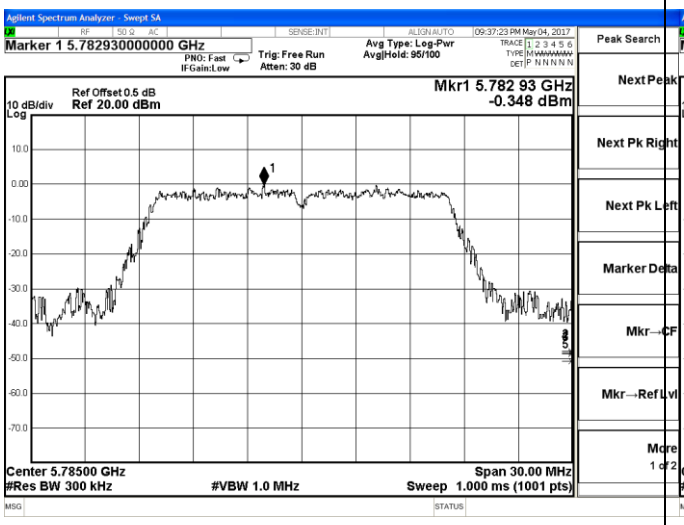
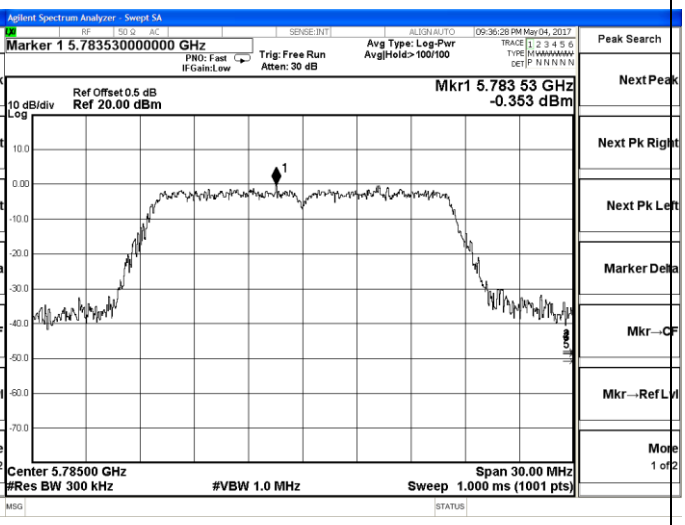
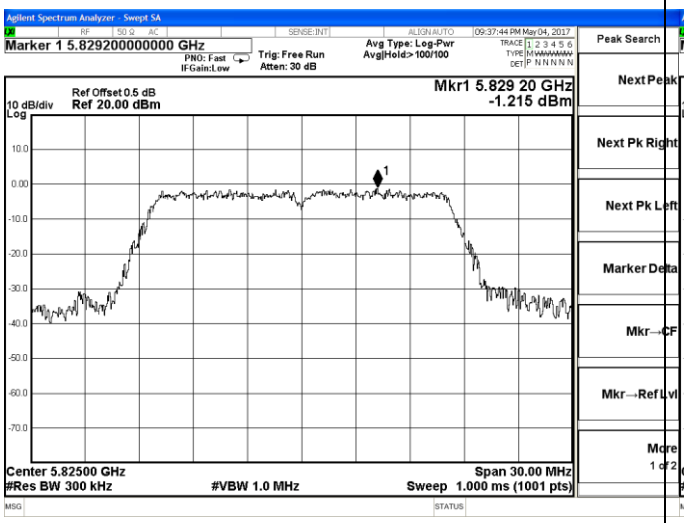
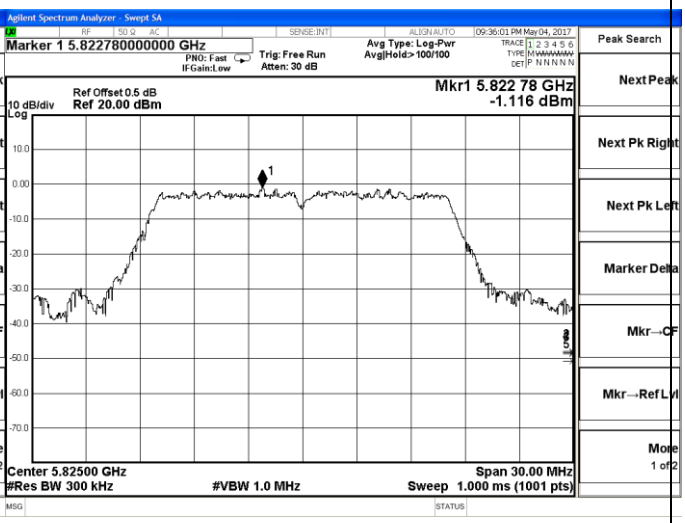
Test Mode	Channel	Frequency (MHz)	Measured Conducted PSD (dBm/300KHz)			Duty Cycle factor (dB)	RBW factor (dB)	Report Conducted PSD (dBm/500KHz)			Limits (dBm/500KHz)	Verdict
			Antenna 0	Antenna 1	Sum			Antenna 0	Antenna 1	Sum		
IEEE 802.11a	149	5745	-0.450	-1.143	/	0.000	2.218	1.768	1.075	/	30.00	PASS
	157	5785	-0.348	-0.353	/	0.000	2.218	1.870	1.865	/		
	165	5825	-1.215	-1.116	/	0.000	2.218	1.003	1.102	/		
IEEE 802.11n HT20	149	5745	-1.989	-2.254	0.891	0.000	2.218	0.229	-0.036	3.109	30.00	PASS
	157	5785	-2.376	-2.039	0.806	0.000	2.218	-0.158	0.179	3.024		
	165	5825	-2.282	-2.070	0.836	0.000	2.218	-0.064	0.148	3.054		
IEEE 802.11ac VHT20	149	5745	-2.809	-2.702	0.255	0.000	2.218	-0.591	-0.484	2.473	30.00	PASS
	157	5785	-3.138	-3.212	-0.165	0.000	2.218	-0.920	-0.994	2.053		
	165	5825	-3.732	-3.331	-0.517	0.000	2.218	-1.514	-1.113	1.701		
IEEE 802.11n HT40	151	5755	-4.811	-4.862	-1.826	0.000	2.218	-2.593	-2.644	0.392	30.00	PASS
	159	5795	-5.197	-4.739	-1.952	0.000	2.218	-2.979	-2.521	0.266		
IEEE 802.11ac VHT40	151	5755	-5.368	-5.527	-2.436	0.000	2.218	-3.150	-3.309	-0.218	30.00	PASS
	159	5795	-5.861	-5.574	-2.705	0.000	2.218	-3.643	-3.356	-0.487		
IEEE 802.11ac VHT80	155	5775	-7.553	-7.715	-4.623	0.000	2.218	-5.335	-5.497	-2.405	30.00	PASS

Remark:

1. *Measured power spectrum density at difference data rate for each mode and recorded worst case for each mode.*
2. *Test results including cable loss;*
3. *Worst case data at 6Mbps at IEEE 802.11a; MCS0 at IEEE 802.11n HT20, IEEE 802.11n HT40, IEEE 802.11a VHT20, IEEE 802.11ac VHT40 and IEEE 802.11ac VHT80;*
4. *For MIMO with CCD technology device, The Directional Gain= Gain of individual transmit antennas (dBi) + Array gain;*
   Array gain = 10 log (N_{ant}), where N_{ant} is the number of transmit antennas.
5. *Directional Gain = 2.00 + 10log (2) = 5.01 dBi < 6dBi; no need reduce power spectrum density limit;*
6. *Report conducted PSD = measured conducted PSD + Duty Cycle factor + RBW factor;*
7. *RBW factor = 10 log (500 KHz / 300 KHz) = 2.218 dB;*
8. *Please refer to following test plots;*

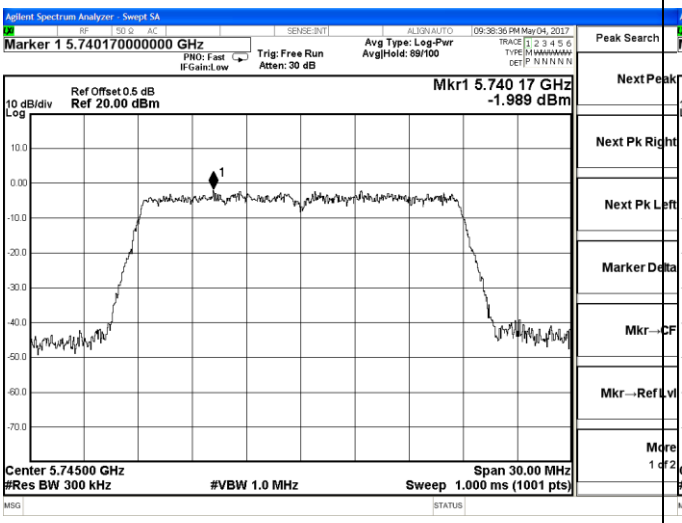
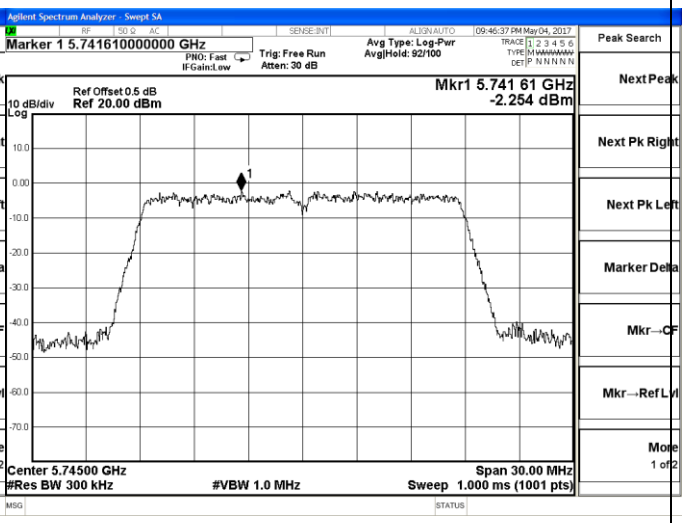
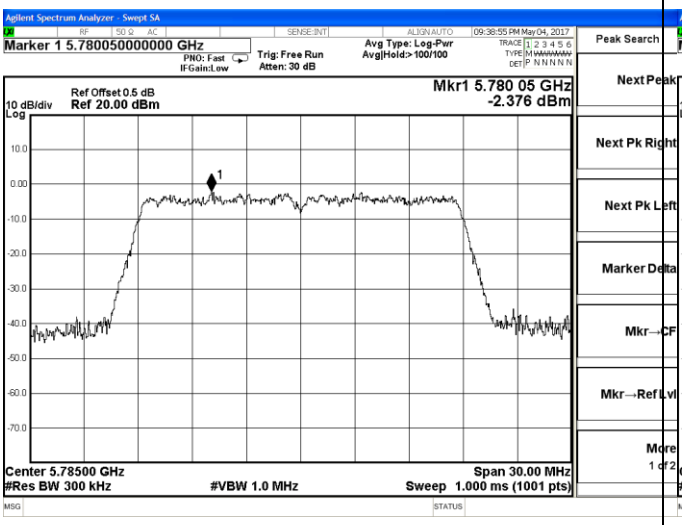
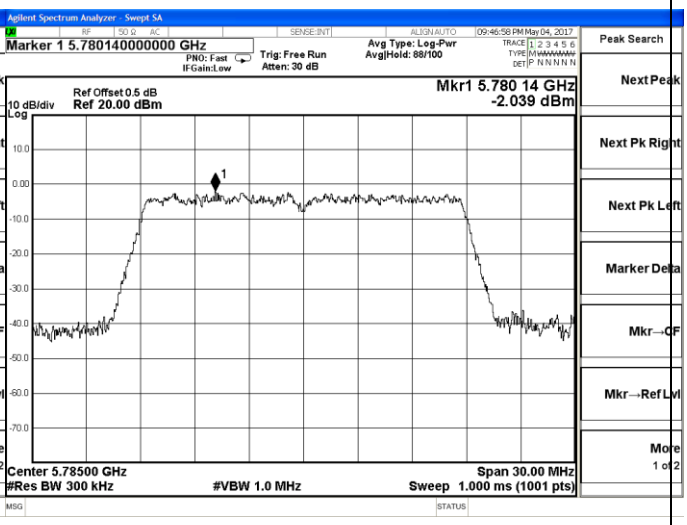
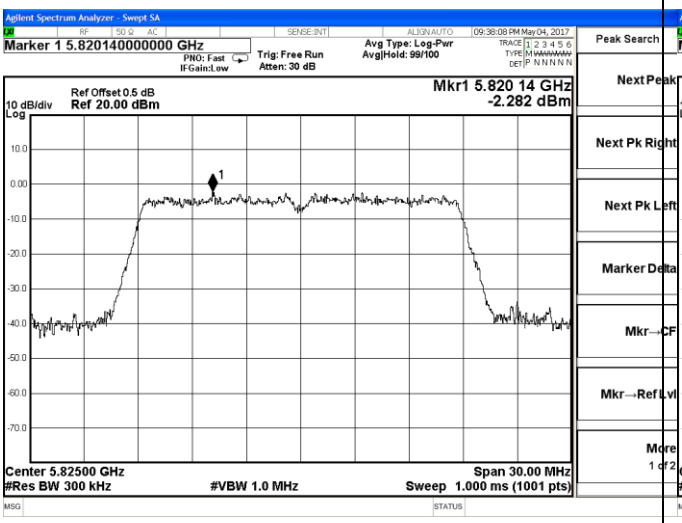
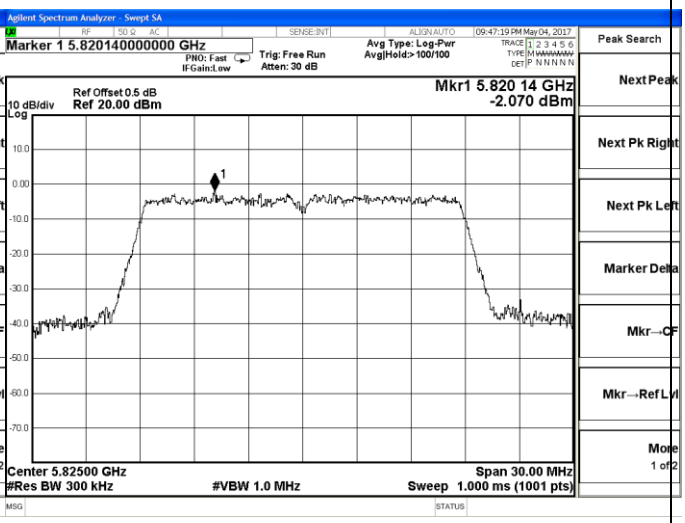
Power Spectral Density

IEEE 802.11a

Antenna Chain 0	Antenna Chain 1
	
Channel 149 / 5745 MHz	Channel 149 / 5745 MHz
	
Channel 157 / 5785 MHz	Channel 157 / 5785 MHz
	
Channel 165 / 5825 MHz	Channel 165 / 5825 MHz

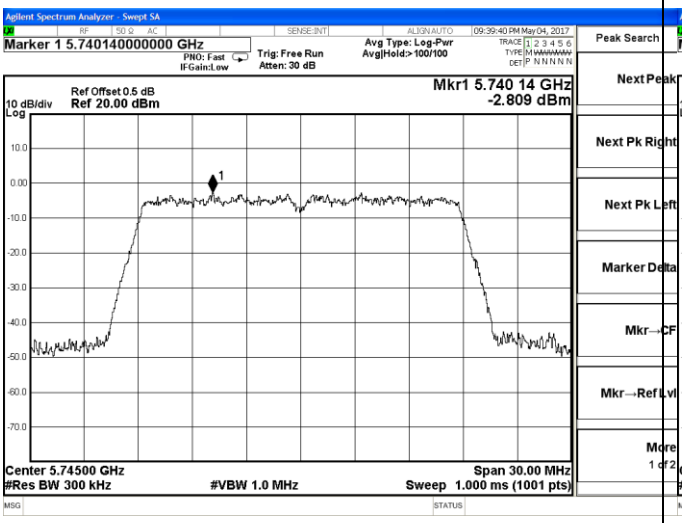
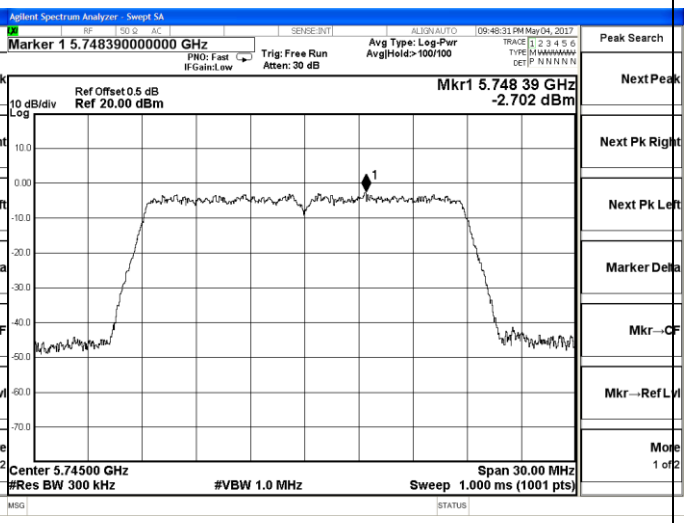
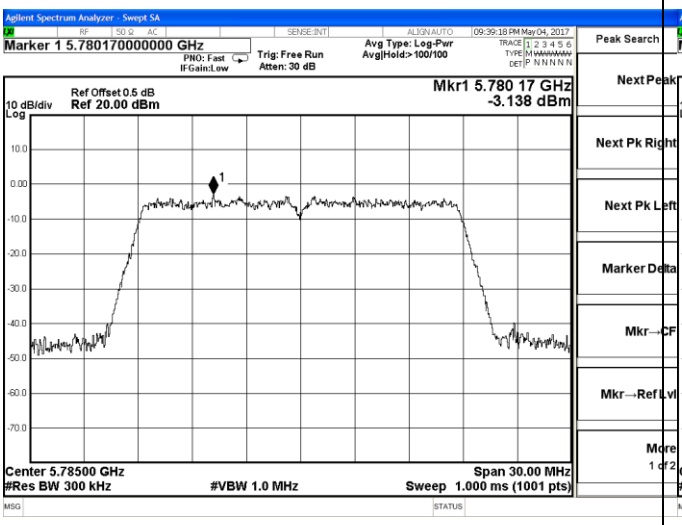
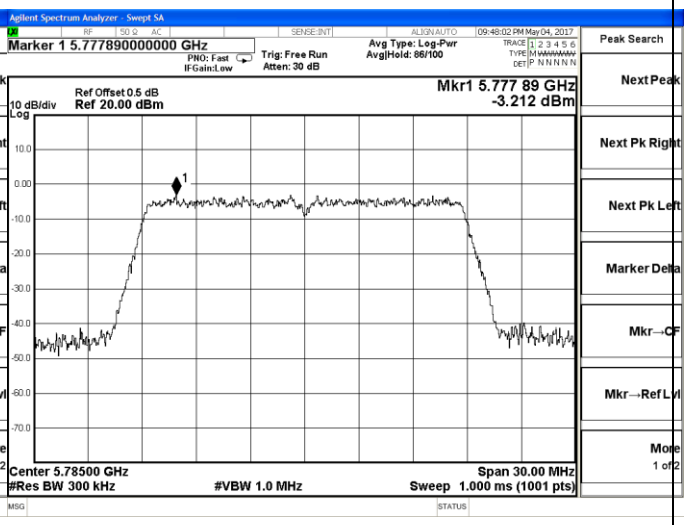
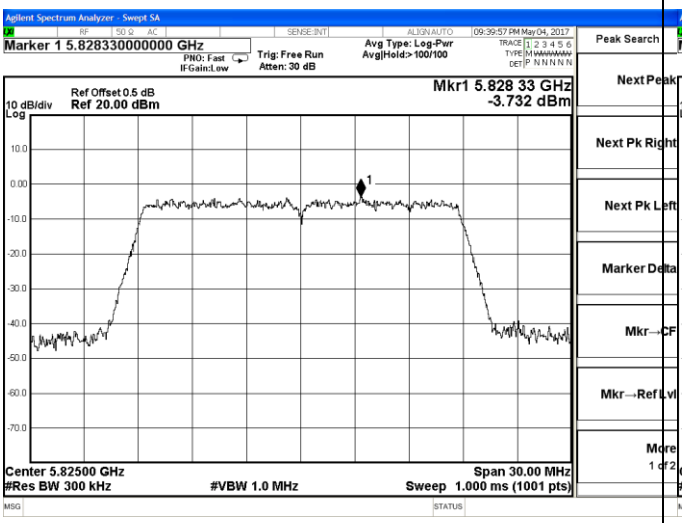
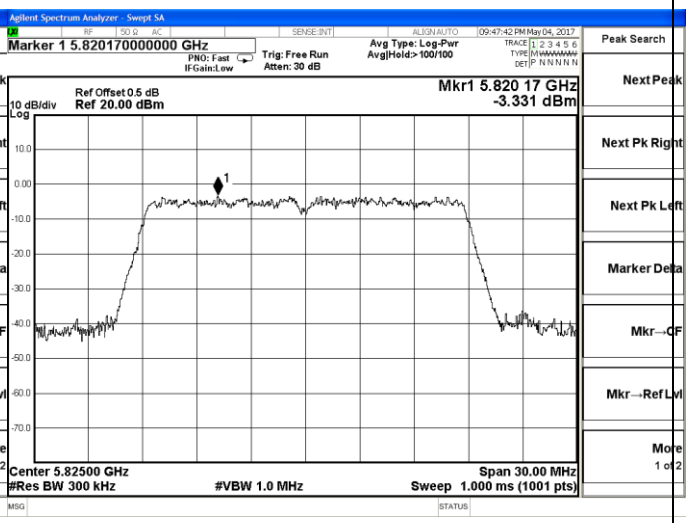
Power Spectral Density

IEEE 802.11n HT20

Antenna Chain 0	Antenna Chain 1
	
Channel 149 / 5745 MHz	Channel 149 / 5745 MHz
	
Channel 157 / 5785 MHz	Channel 157 / 5785 MHz
	
Channel 165 / 5825 MHz	Channel 165 / 5825 MHz

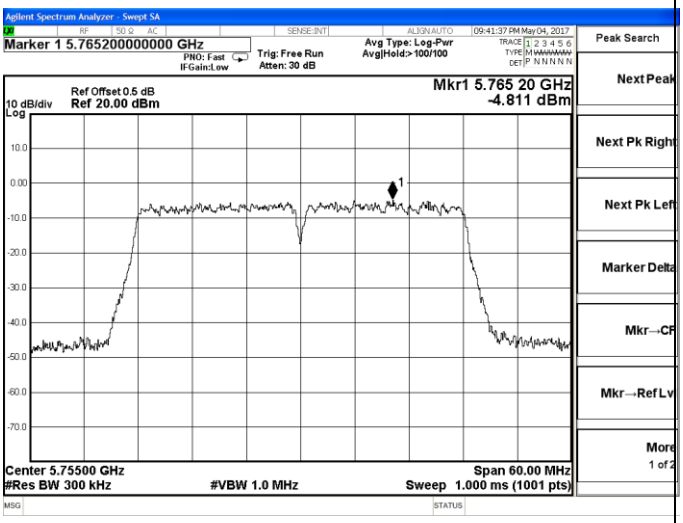
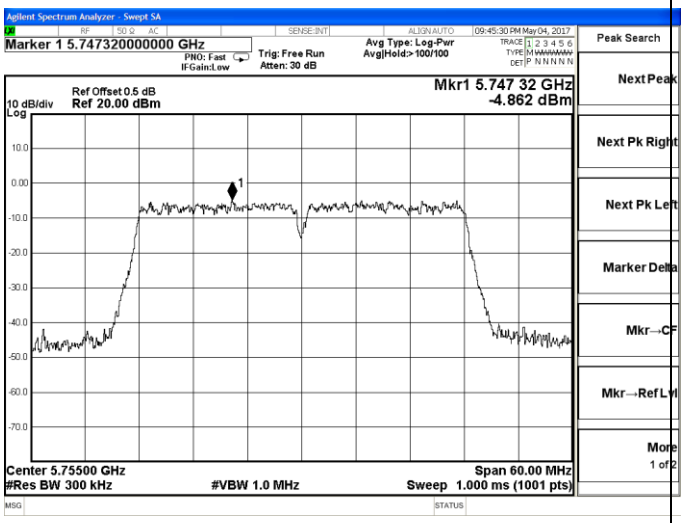
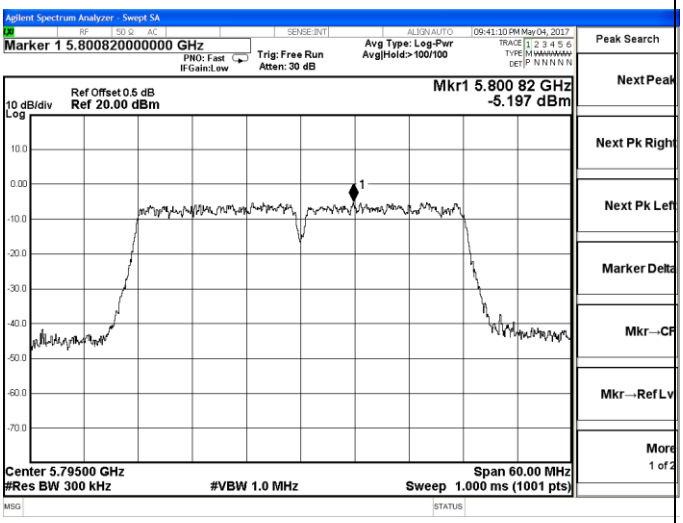
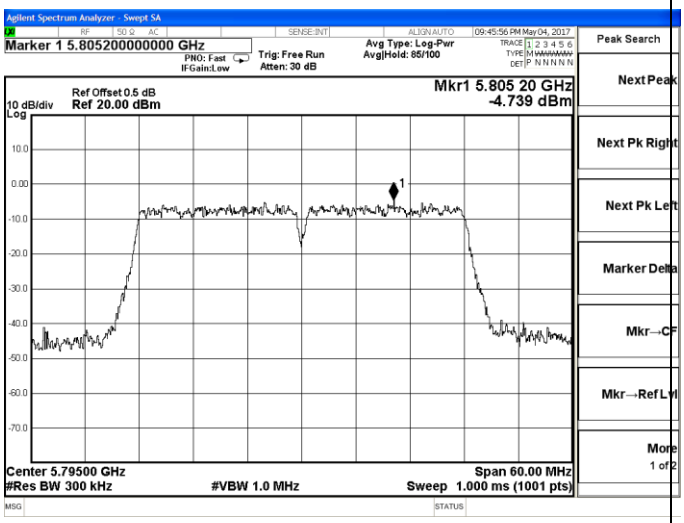
Power Spectral Density

IEEE 802.11ac VHT20

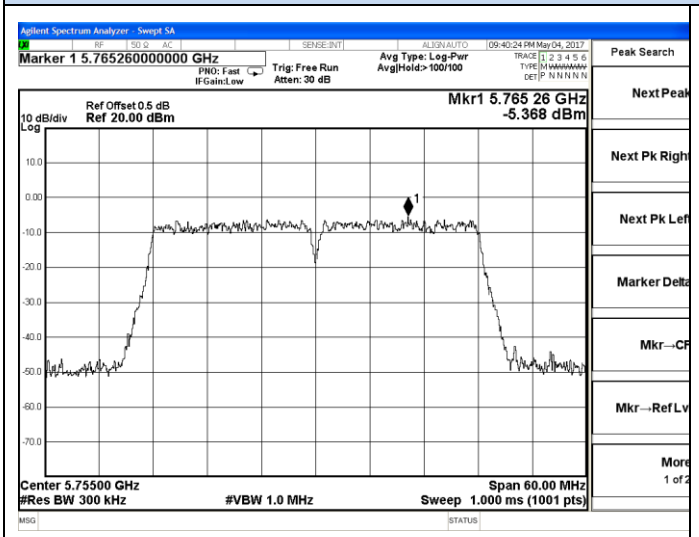
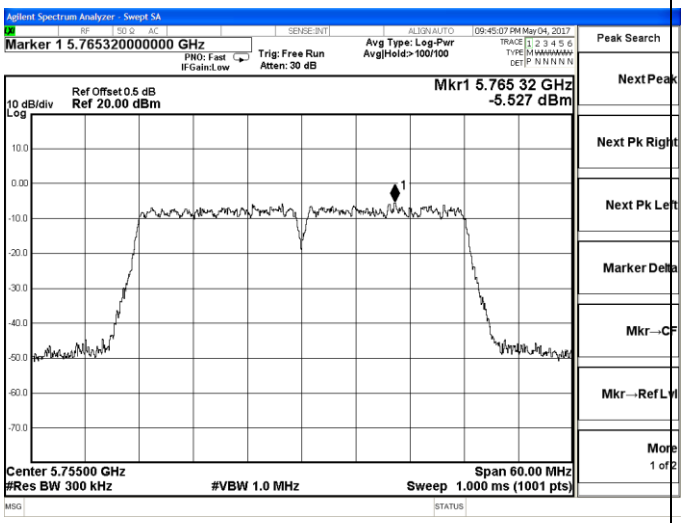
Antenna Chain 0	Antenna Chain 1
	
Channel 149 / 5745 MHz	Channel 149 / 5745 MHz
	
Channel 157 / 5785 MHz	Channel 157 / 5785 MHz
	
Channel 165 / 5825 MHz	Channel 165 / 5825 MHz

Power Spectral Density

IEEE 802.11n HT40

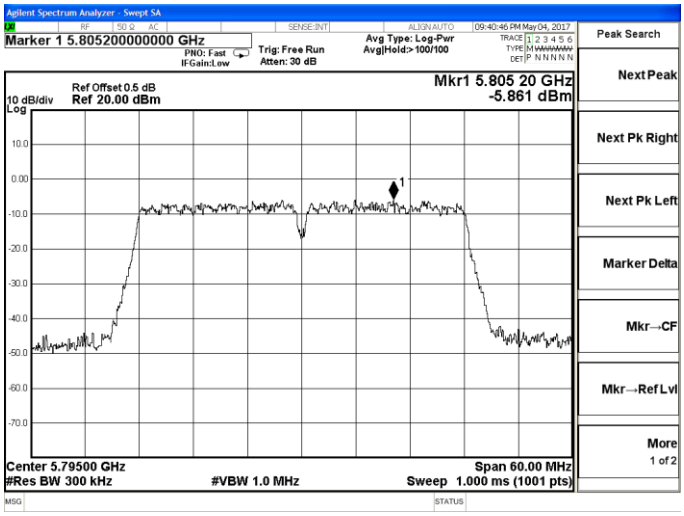
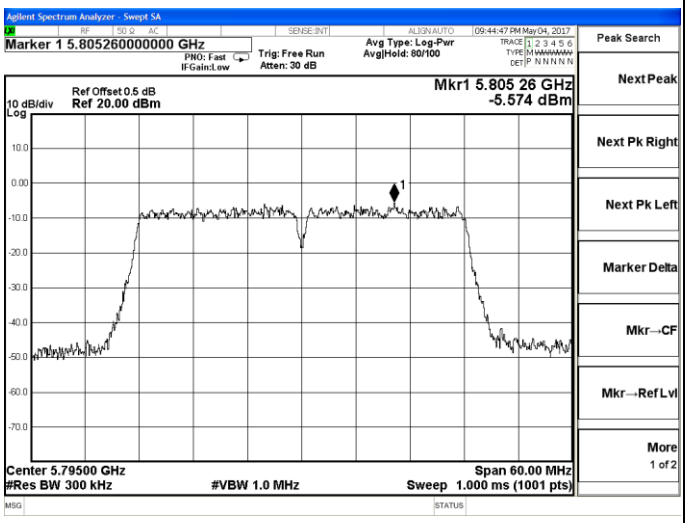
Antenna Chain 0	Antenna Chain 1
	
Channel 151 / 5755 MHz	Channel 151 / 5755 MHz
	
Channel 159 / 5795 MHz	Channel 159 / 5795 MHz

IEEE 802.11ac VHT40

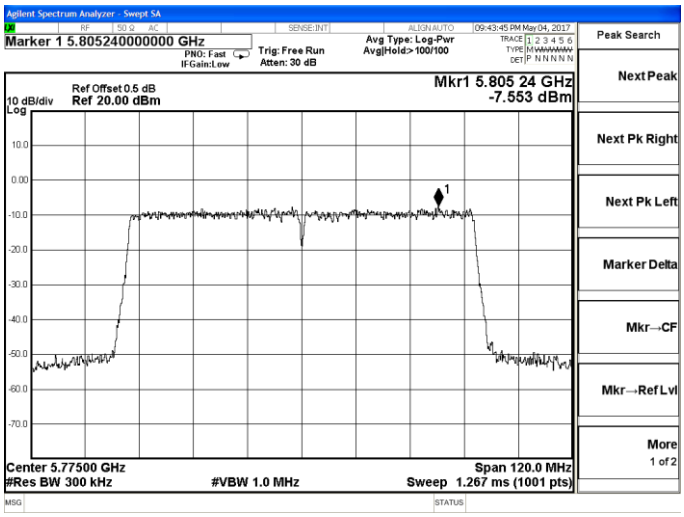
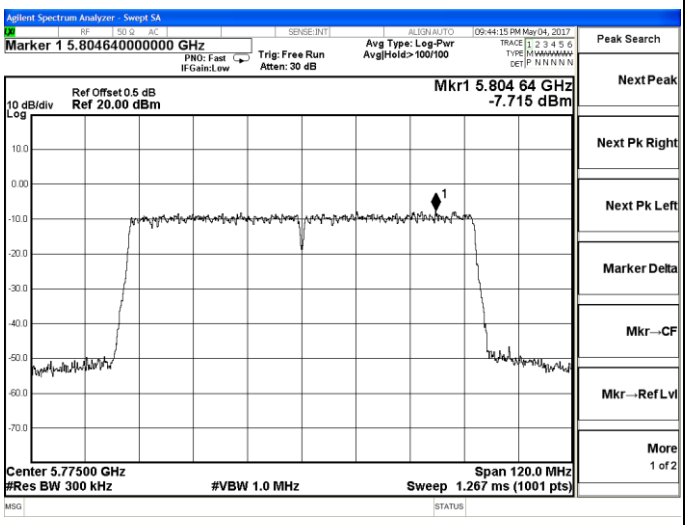
	
Channel 151 / 5755 MHz	Channel 151 / 5755 MHz

Power Spectral Density

IEEE 802.11ac VHT40

Antenna Chain 0	Antenna Chain 1
	
Channel 159 / 5795 MHz	Channel 159 / 5795 MHz

IEEE 802.11ac VHT80

	
Channel 155 / 5775 MHz	Channel 155 / 5775 MHz

5.4. 6dB Occupied Bandwidth Measurement

5.4.1. Standard Applicable

Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

5.4.2. Measuring Instruments and Setting

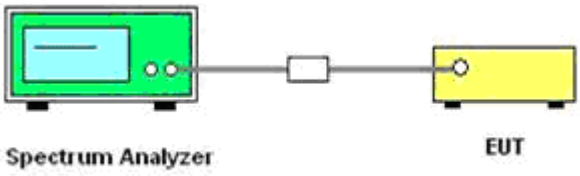
Please refer to section 6 of equipment list in this report. The following table is the setting of the Spectrum Analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span	> 26dB Bandwidth
Detector	Peak
Trace	Max Hold
Sweep Time	100ms

5.4.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyzer in peak hold mode.
2. The resolution bandwidth of 100 kHz and the video bandwidth of 300 kHz were used.
3. Measured the spectrum width with power higher than 6dB below carrier.

5.4.4. Test Setup Layout



5.4.5. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

5.4.6. Test Result of 6dB Occupied Bandwidth

Temperature	25℃	Humidity	60%
Test Engineer	Aking Jin	Configurations	IEEE 802.11a/n/ac

Test Mode	Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Limits (MHz)	Verdict
			Antenna 0	Antenna 1		
IEEE 802.11a	149	5745	16.59	16.60	≥0.500	PASS
	157	5785	16.60	16.61		
	163	5825	16.57	16.60		
IEEE 802.11n HT20	149	5745	17.81	17.84	≥0.500	PASS
	157	5785	17.80	17.80		
	163	5825	17.80	17.83		
IEEE 802.11ac VHT20	149	5745	17.83	17.83	≥0.500	PASS
	157	5785	17.81	17.83		
	163	5825	17.84	17.81		
IEEE 802.11n HT40	151	5755	36.50	36.48	≥0.500	PASS
	159	5795	36.51	36.55		
IEEE 802.11ac VHT40	151	5755	36.50	36.54	≥0.500	PASS
	159	5795	36.49	36.48		
IEEE 802.11ac VHT80	155	5775	75.68	76.56	≥0.500	PASS

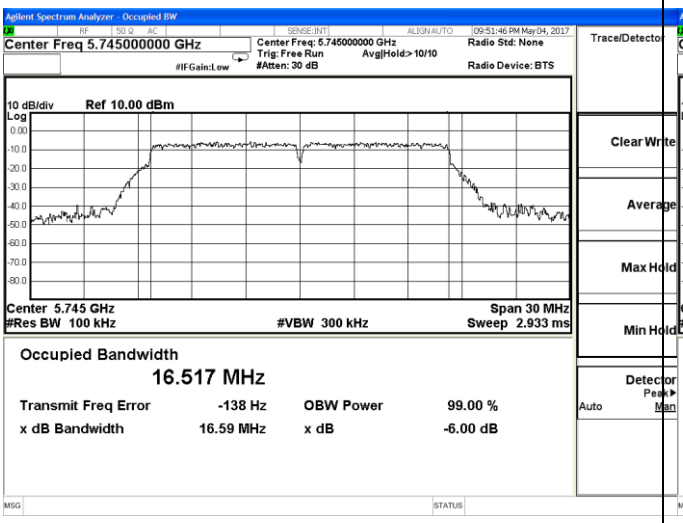
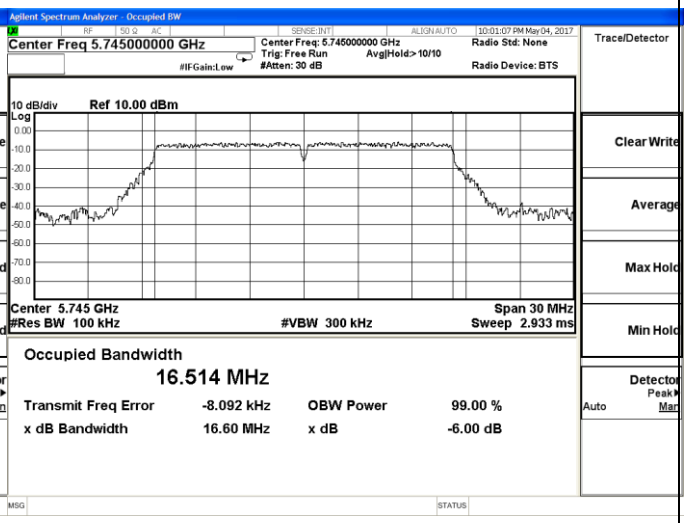
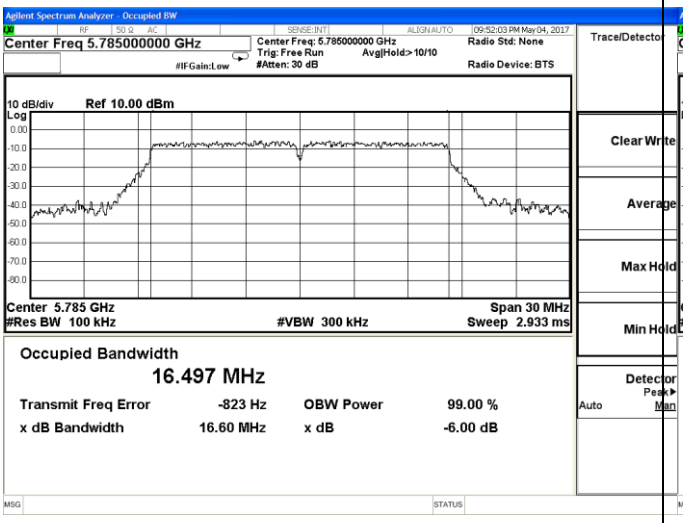
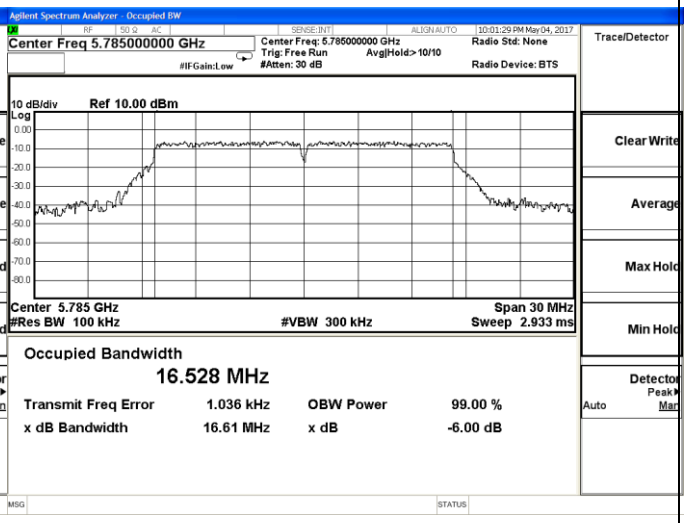
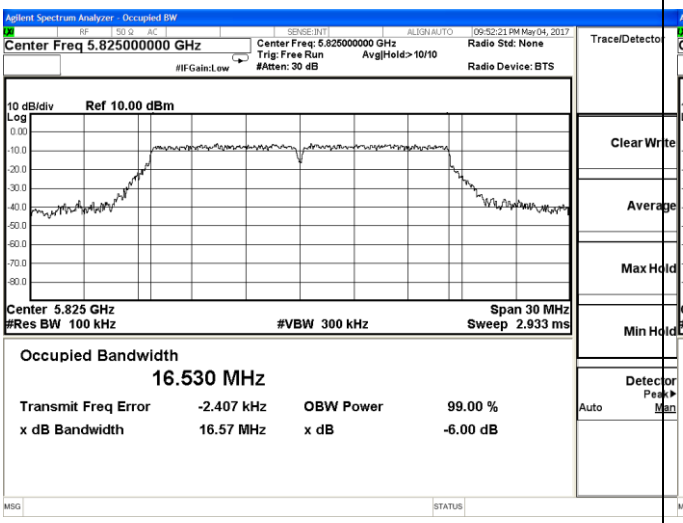
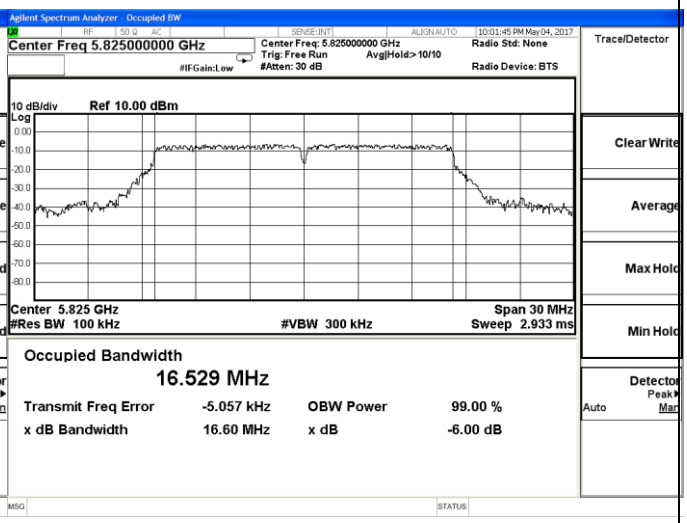
Remark:

1. *Measured 6dB bandwidth at difference data rate for each mode and recorded worst case for each mode.*
2. *Test results including cable loss;*
3. *Worst case data at 6Mbps at IEEE 802.11a; MCS0 at IEEE 802.11n HT20, IEEE 802.11n HT40, IEEE 802.11a VHT20, IEEE 802.11ac VHT40 and IEEE 802.11ac VHT80;*
4. *Please refer to following test plots;*

This report shall not be reproduced except in full, without the written approval of Shenzhen LCS Compliance Testing Laboratory Ltd.

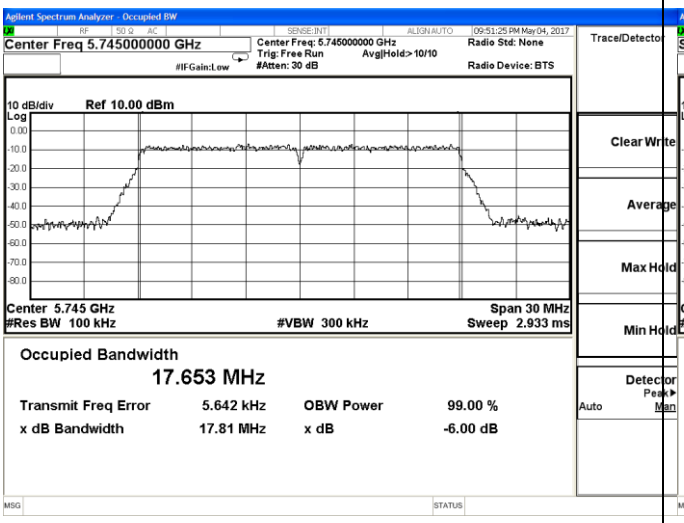
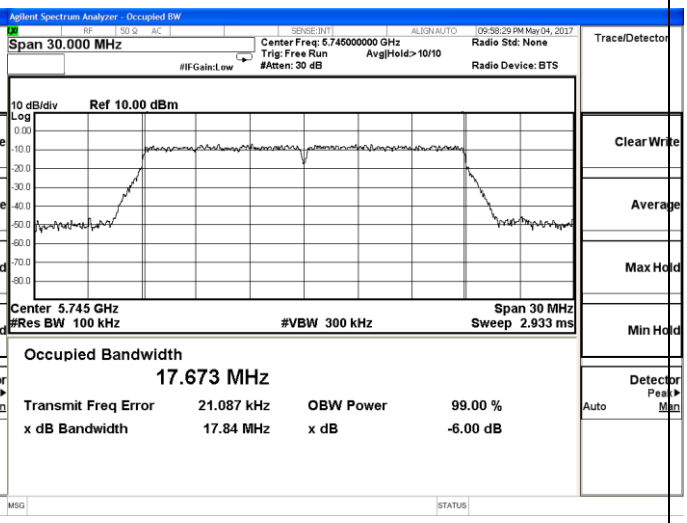
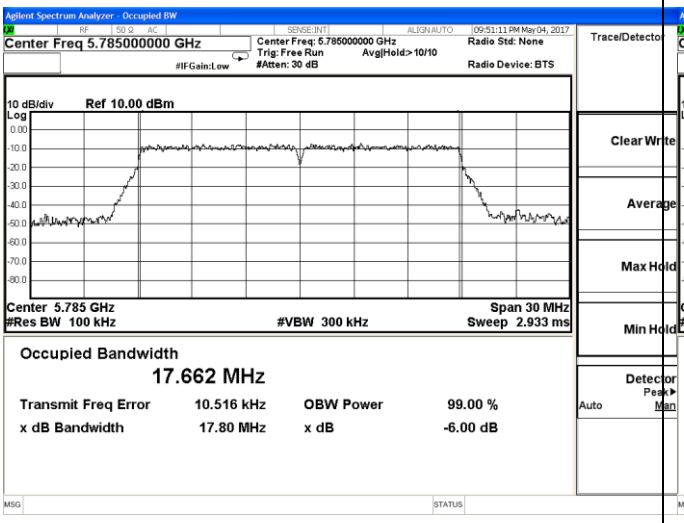
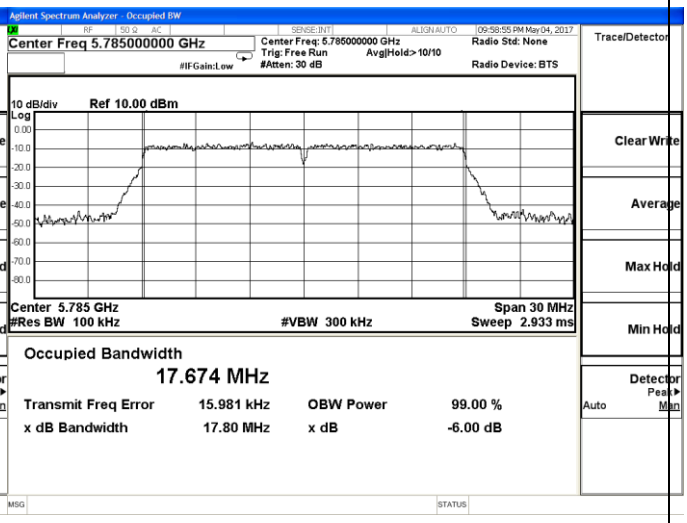
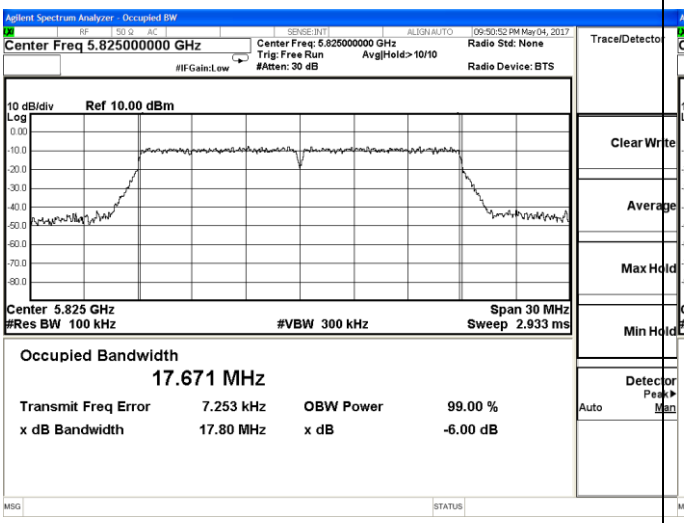
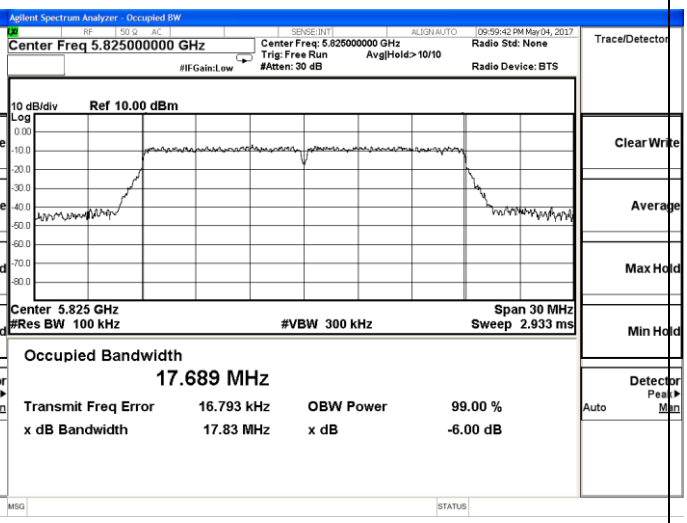
6dB Bandwidth

IEEE 802.11a

Antenna Chain 0	Antenna Chain 1
	
Channel 149 / 5745 MHz	Channel 149 / 5745 MHz
	
Channel 157 / 5785 MHz	Channel 157 / 5785 MHz
	
Channel 165 / 5825 MHz	Channel 165 / 5825 MHz

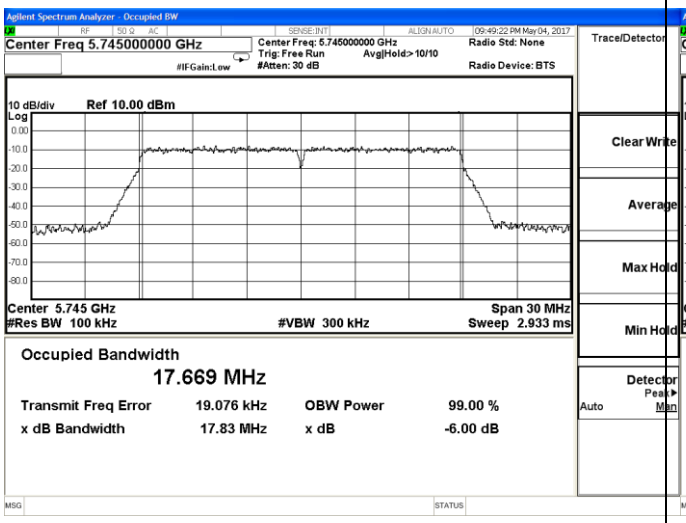
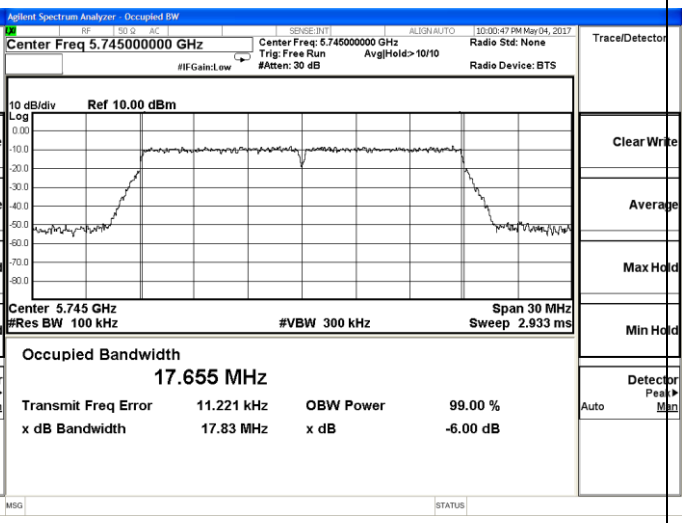
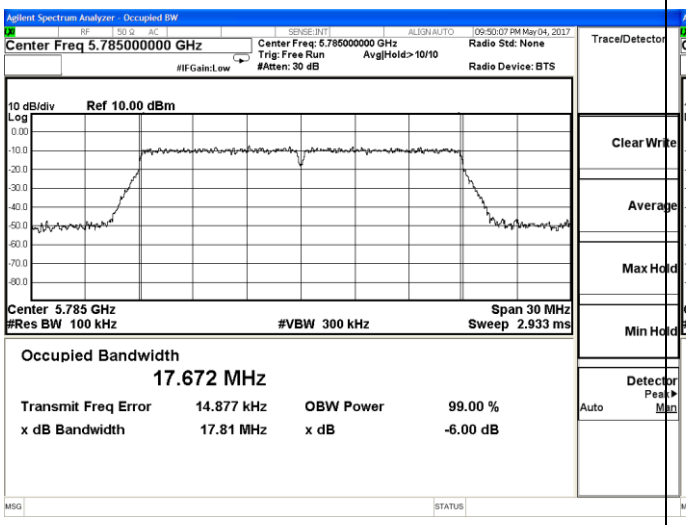
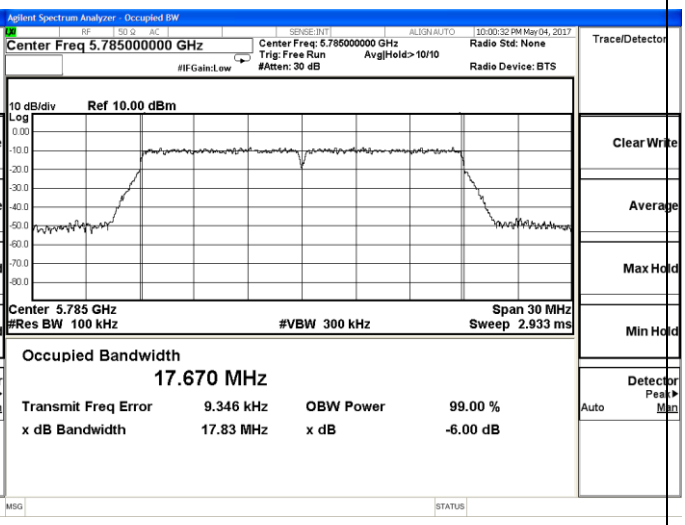
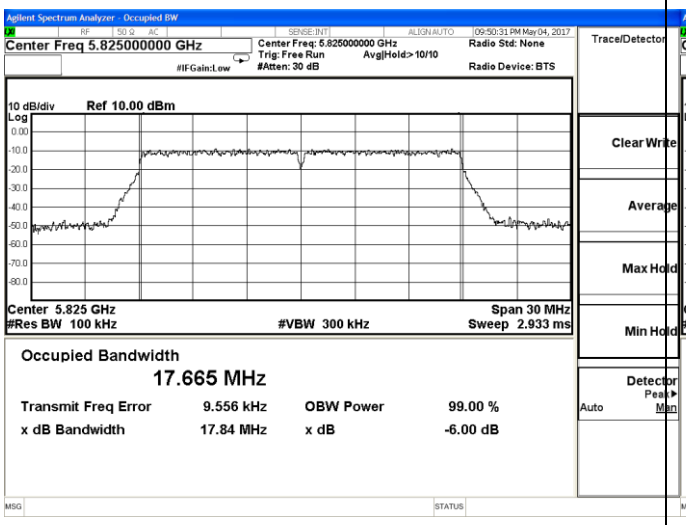
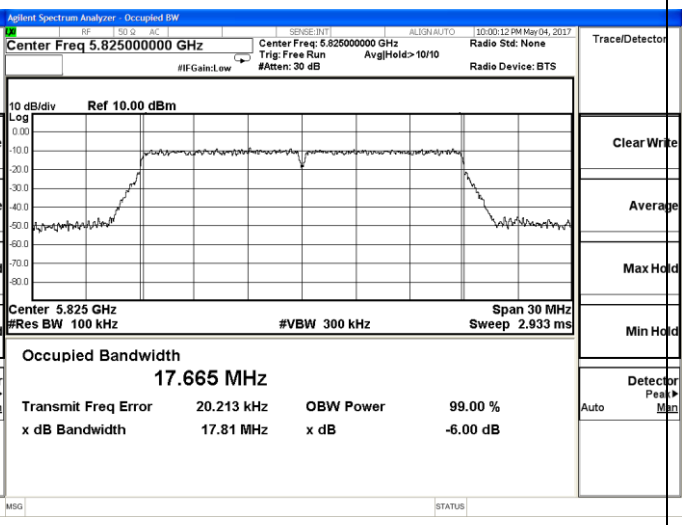
6dB Bandwidth

IEEE 802.11n HT20

Antenna Chain 0	Antenna Chain 1
	
Channel 149 / 5745 MHz	Channel 149 / 5745 MHz
	
Channel 157 / 5785 MHz	Channel 157 / 5785 MHz
	
Channel 165 / 5825 MHz	Channel 165 / 5825 MHz

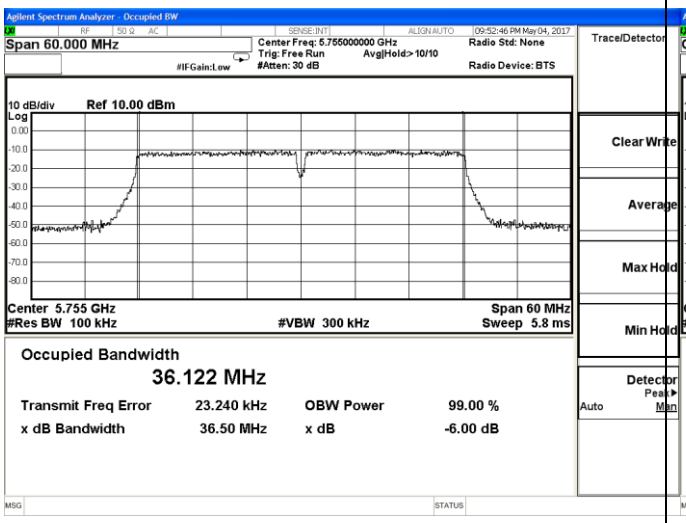
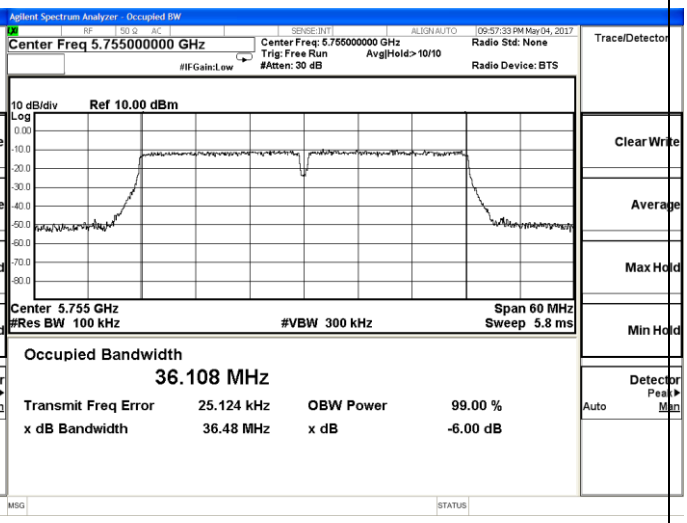
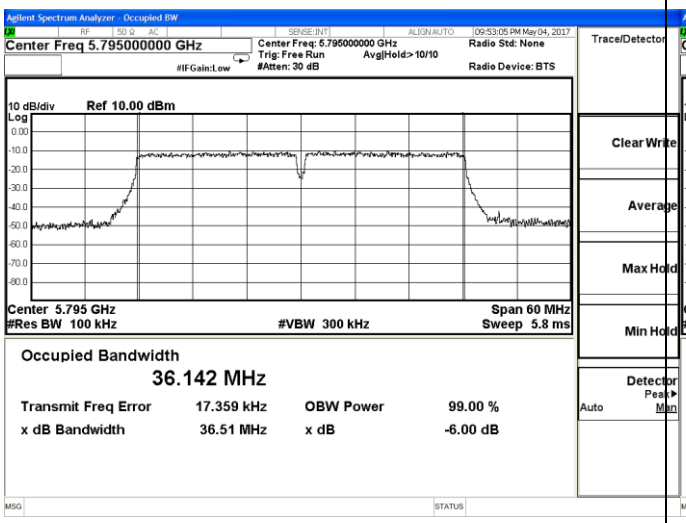
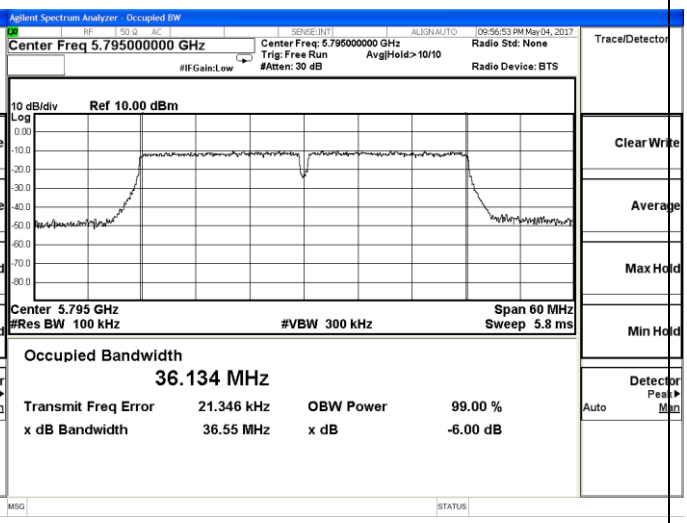
6dB Bandwidth

IEEE 802.11ac VHT20

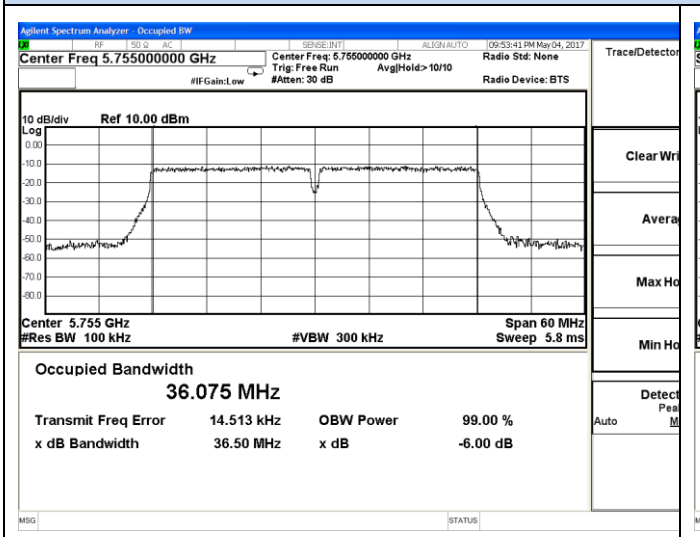
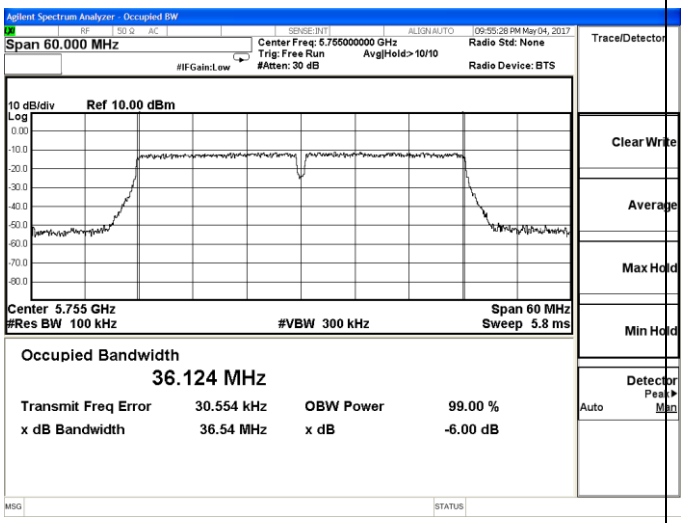
Antenna Chain 0	Antenna Chain 1
	
Channel 149 / 5745 MHz	Channel 149 / 5745 MHz
	
Channel 157 / 5785 MHz	Channel 157 / 5785 MHz
	
Channel 165 / 5825 MHz	Channel 165 / 5825 MHz

6dB Bandwidth

IEEE 802.11n HT40

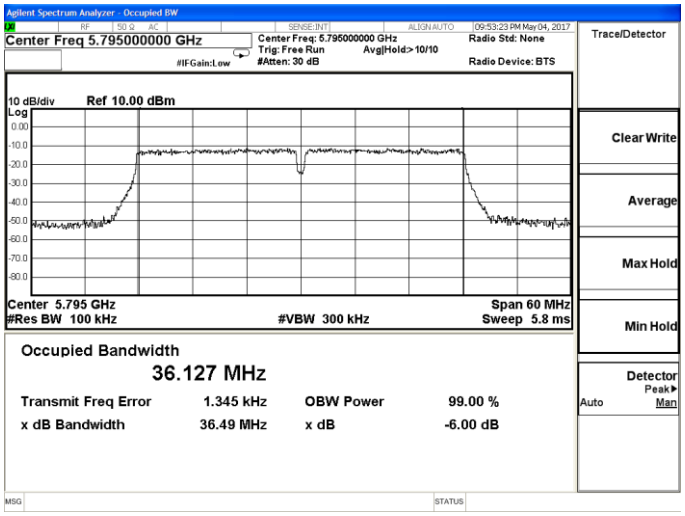
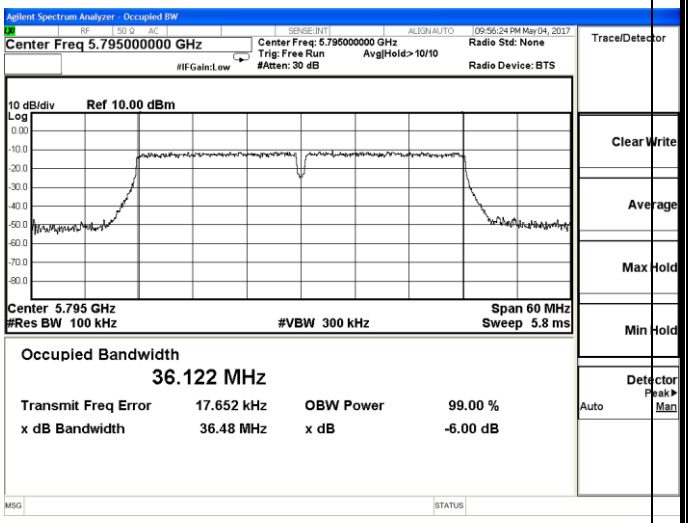
Antenna Chain 0	Antenna Chain 1
	
Channel 151 / 5755 MHz	Channel 151 / 5755 MHz
	
Channel 159 / 5795 MHz	Channel 159 / 5795 MHz

IEEE 802.11ac VHT40

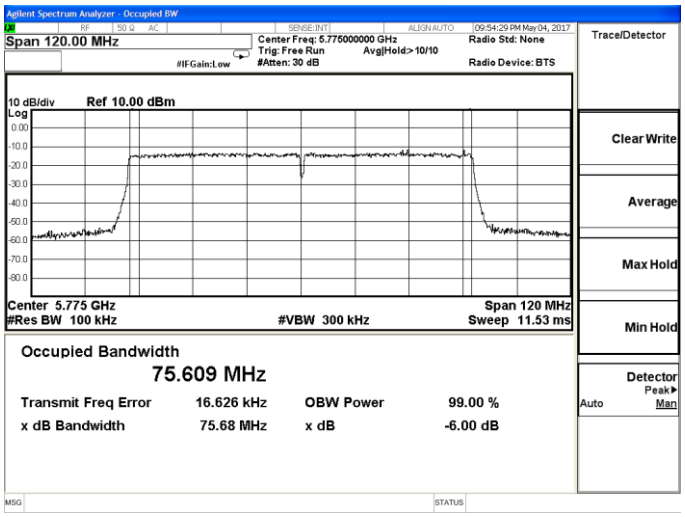
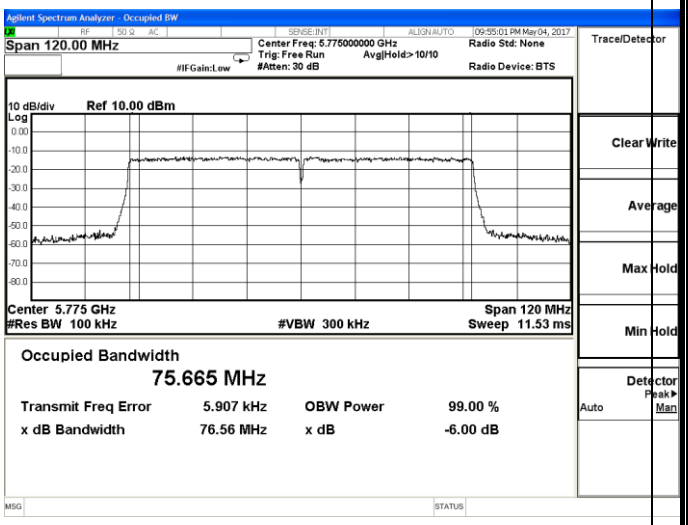
	
Channel 151 / 5755 MHz	Channel 151 / 5755 MHz

6dB Bandwidth

IEEE 802.11ac VHT40

Antenna Chain 0	Antenna Chain 1
	
Channel 159 / 5795 MHz	Channel 159 / 5795 MHz

IEEE 802.11ac VHT80

	
Channel 155 / 5775 MHz	Channel 155 / 5775 MHz

5.5. Radiated Emissions Measurement

5.5.1. Standard Applicable

15.205 (a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
\1\ 0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293.	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(\2\)
13.36-13.41			

\1\ Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.
\2\ Above 38.6

For transmitters operating in the 5.725-5.85 GHz band:

All emissions shall be limited to a level of −27 dBm/MHz(68.2dBuV/m at 3m) at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz(105.2dBuV/m at 3m) at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6(110.8dBuV/m at 3m) dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz(122.2dBuV/m at 3m) at the band edge.

In addition, In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (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

5.5.2. Measuring Instruments and Setting

Please refer to section 6 of equipment list in this report. The following table is the setting of spectrum analyzer and receiver.

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (Emission in restricted band)	1MHz / 1MHz for Peak, 1 MHz / 1/B kHz for Average
RB / VB (Emission in non-restricted band)	1MHz / 1MHz for Peak, 1 MHz / 1/B kHz for Average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB/VB 200Hz/1KHz for QP/AVG
Start ~ Stop Frequency	150kHz~30MHz / RB/VB 9kHz/30KHz for QP/AVG
Start ~ Stop Frequency	30MHz~1000MHz / RB/VB 120kHz/1MHz for QP

5.5.3. Test Procedures

1) **Sequence of testing 9 kHz to 30 MHz**

Setup:

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a rotatable table with 0.8 m height is used.

--- If the EUT is a floor standing device, it is placed on the ground.

--- Auxiliary equipment and cables were positioned to simulate normal operation conditions.

--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.

--- The measurement distance is 3 meter.

--- The EUT was set into operation.

Premeasurement:

--- The turntable rotates from 0° to 315° using 45° steps.

--- The antenna height is 1.5 meter.

--- At each turntable position the analyzer sweeps with peak detection to find the maximum of all emissions

Final measurement:

--- Identified emissions during the premeasurement the software maximizes by rotating the turntable position (0° to 360°) and by rotating the elevation axes (0° to 360°).

--- The final measurement will be done in the position (turntable and elevation) causing the highest emissions with QPK detector.

--- The final levels, frequency, measuring time, bandwidth, turntable position, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement and the limit will be stored.

This report shall not be reproduced except in full, without the written approval of Shenzhen LCS Compliance Testing Laboratory Ltd.

2) **Sequence of testing 30 MHz to 1 GHz**

Setup:

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a table with 0.8 m height is used, which is placed on the ground plane.

--- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.

--- Auxiliary equipment and cables were positioned to simulate normal operation conditions

--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.

--- The measurement distance is 3 meter.

--- The EUT was set into operation.

Premeasurement:

--- The turntable rotates from 0° to 315° using 45° steps.

--- The antenna is polarized vertical and horizontal.

--- The antenna height changes from 1 to 3 meter.

--- At each turntable position, antenna polarization and height the analyzer sweeps three times in peak to find the maximum of all emissions.

Final measurement:

--- The final measurement will be performed with minimum the six highest peaks.

--- According to the maximum antenna and turntable positions of premeasurement the software maximize the peaks by changing turntable position (± 45°) and antenna movement between 1 and 4 meter.

--- The final measurement will be done with QP detector with an EMI receiver.

--- The final levels, frequency, measuring time, bandwidth, antenna height, antenna polarization, turntable angle, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement with marked maximum final measurements and the limit will be stored.

3) **Sequence of testing 1 GHz to 18 GHz**

Setup:

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a rotatable table with 1.5 m height is used.

--- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.

--- Auxiliary equipment and cables were positioned to simulate normal operation conditions

--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.

--- The measurement distance is 3 meter.

--- The EUT was set into operation.

Premeasurement:

--- The turntable rotates from 0° to 315° using 45° steps.

--- The antenna is polarized vertical and horizontal.

--- The antenna height scan range is 1 meter to 2.5 meter.

--- At each turntable position and antenna polarization the analyzer sweeps with peak detection to find the maximum of all emissions.

Final measurement:

--- The final measurement will be performed with minimum the six highest peaks.

--- According to the maximum antenna and turntable positions of premeasurement the software maximize the peaks by changing turntable position (± 45°) and antenna movement between 1 and 4 meter. This procedure is repeated for both antenna polarizations.

--- The final measurement will be done in the position (turntable, EUT-table and antenna polarization) causing the highest emissions with Peak and Average detector.

--- The final levels, frequency, measuring time, bandwidth, turntable position, EUT-table position, antenna polarization, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement with marked maximum final measurements and the limit will be stored.

4) **Sequence of testing above 18 GHz**

Setup:

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a rotatable table with 1.5 m height is used.

--- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.

--- Auxiliary equipment and cables were positioned to simulate normal operation conditions

--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.

--- The measurement distance is 1 meter.

--- The EUT was set into operation.

Premeasurement:

--- The antenna is moved spherical over the EUT in different polarizations of the antenna.

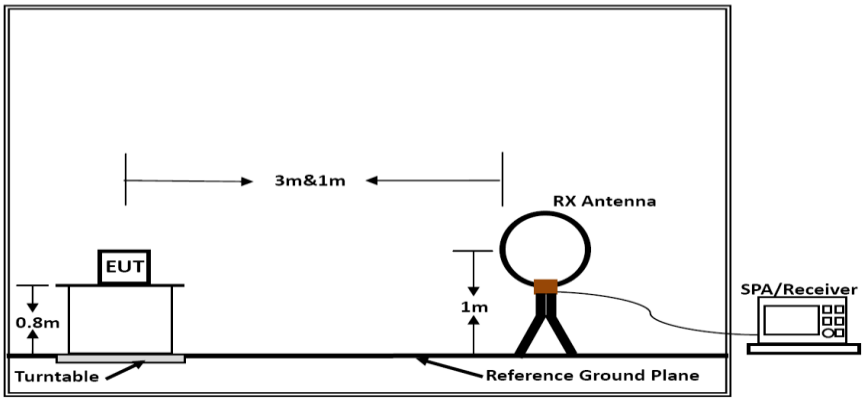
Final measurement:

--- The final measurement will be performed at the position and antenna orientation for all detected emissions that were found during the premeasurements with Peak and Average detector.

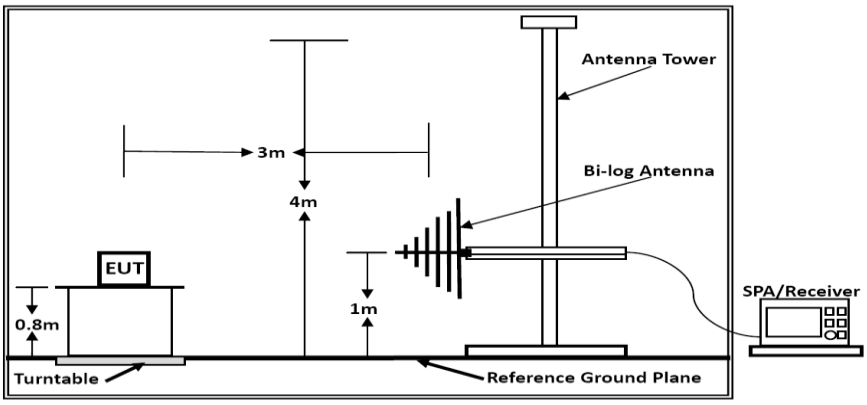
--- The final levels, frequency, measuring time, bandwidth, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement and the limit will be stored.

5.5.4. Test Setup Layout

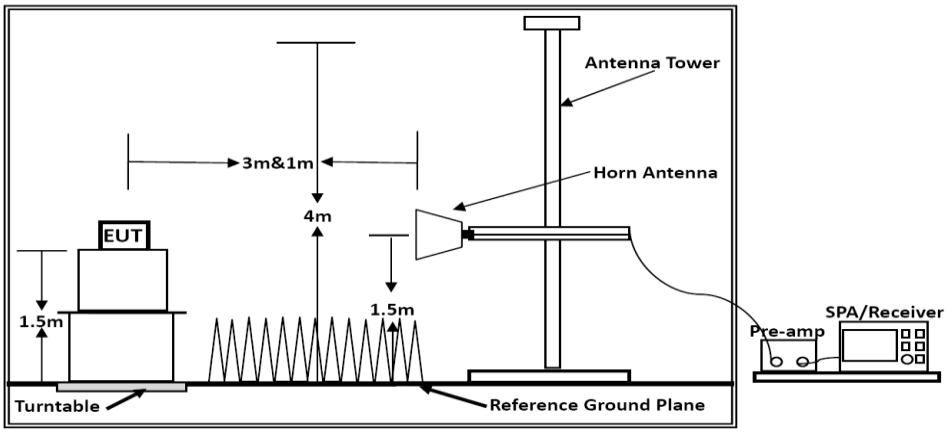
For radiated emissions below 30MHz



Below 30MHz



Below 1GHz



Above 1GHz

Above 18 GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade form 3m to 1m.

Distance extrapolation factor = 20 log (specific distanc [3m] / test distance [1.5m]) (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor [6 dB].

5.5.5. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

5.5.6. Results of Radiated Emissions (9 KHz~30MHz)

Temperature	25℃	Humidity	60%
Test Engineer	Aking Jin	Configurations	IEEE 802.11a/n/ac

Freq. (MHz)	Level (dBuV)	Over Limit (dB)	Over Limit (dBuV)	Remark
-	-	-	-	See Note

Note:

The amplitude of spurious emissions which are attenuated by more than 20 dB below the permissible value has no need to be reported.

Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

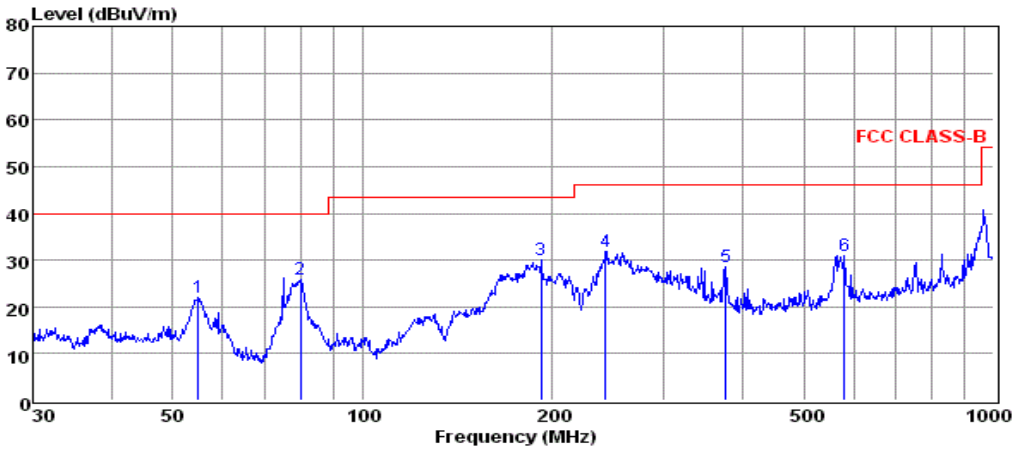
Limit line = specific limits (dBuV) + distance extrapolation factor.

5.5.7. Results of Radiated Emissions (30MHz~1GHz)

Temperature	25℃	Humidity	60%
Test Engineer	Aking Jin	Configurations	IEEE 802.11a, 5240MHz

Test result for IEEE 802.11a-5745MHz

Horizontal:

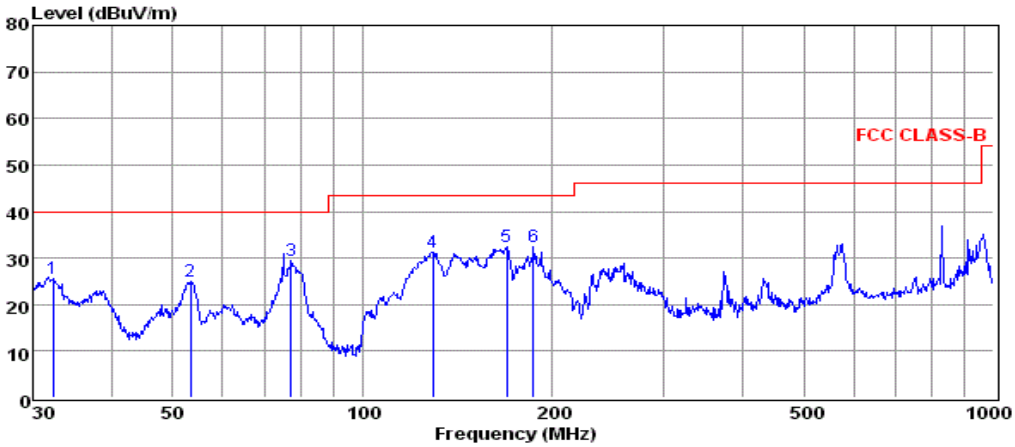


pol: HORIZONTAL

	Freq MHz	Reading dBuV	CabLos dB	Antfac dB/m	Measured dBuV/m	Limit dBuV/m	Over dB	Remark
1	54.83	8.44	0.46	13.03	21.93	40.00	-18.07	QP
2	79.80	16.73	0.65	8.51	25.89	40.00	-14.11	QP
3	191.75	18.74	0.86	10.56	30.16	43.50	-13.34	QP
4	242.53	18.75	0.90	12.08	31.73	46.00	-14.27	QP
5	375.94	12.91	1.10	14.56	28.57	46.00	-17.43	QP
6	580.70	11.37	1.44	18.09	30.90	46.00	-15.10	QP

Note: 1. All readings are Quasi-peak values.
2. Measured= Reading + Antenna Factor + Cable Loss
3. The emission that ate 20db blow the offficial limit are not reported

Vertical:



pol: VERTICAL

	Freq MHz	Reading dBuV	CabLos dB	Antfac dB/m	Measured dBuV/m	Limit dBuV/m	Over dB	Remark
1	32.29	12.86	0.37	12.32	25.55	40.00	-14.45	QP
2	53.32	11.52	0.46	13.10	25.08	40.00	-14.92	QP
3	77.05	20.78	0.47	8.10	29.35	40.00	-10.65	QP
4	129.01	21.53	0.67	9.08	31.28	43.50	-12.22	QP
5	169.01	22.72	0.80	8.94	32.46	43.50	-11.04	QP
6	186.44	21.05	0.98	10.25	32.28	43.50	-11.22	QP

Note: 1. All readings are Quasi-peak values.
2. Measured= Reading + Antenna Factor + Cable Loss
3. The emission that ate 20db blow the offficial limit are not reported

Note:
Pre-scan all modes and recorded the worst case results in this report (IEEE 802.11a-5745MHz).
Emission level (dBuV/m) = 20 log Emission level (uV/m).
Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

5.5.8. Results for Radiated Emissions (Above 1GHz)

Remark: Measured all modes and recorded worst case;

IEEE 802.11a/ Antenna Chain 0

Channel 149 / 5745 MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measured Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
17.235	54.08	39.32	40.45	6.02	58.97	68.20	-9.23	Peak	Horizontal
17.235	39.86	39.32	40.45	6.02	44.75	54.00	-9.25	Average	Horizontal
17.235	53.96	39.32	40.45	6.02	58.85	68.20	-9.35	Peak	Vertical
17.235	37.72	39.32	40.45	6.02	42.61	54.00	-11.39	Average	Vertical

Channel 157 / 5785 MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measured Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
17.355	54.36	39.41	40.52	6.11	59.36	68.20	-8.84	Peak	Horizontal
17.355	38.18	39.41	40.52	6.11	43.18	54.00	-10.82	Average	Horizontal
17.355	54.30	39.41	40.52	6.11	59.30	68.20	-8.90	Peak	Vertical
17.355	38.91	39.41	40.52	6.11	43.91	54.00	-10.09	Average	Vertical

Channel 163 / 5825 MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measured Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
17.475	55.20	39.48	40.61	6.22	60.29	68.20	-7.91	Peak	Horizontal
17.475	39.49	39.48	40.61	6.22	44.58	54.00	-9.42	Average	Horizontal
17.475	54.99	39.48	40.61	6.22	60.08	68.20	-8.12	Peak	Vertical
17.475	37.39	39.48	40.61	6.22	42.48	54.00	-11.52	Average	Vertical

This report shall not be reproduced except in full, without the written approval of Shenzhen LCS Compliance Testing Laboratory Ltd.

IEEE 802.11n-HT20/Combined Antenna Chain 0 and Antenna Chain 1

Channel 149 / 5745 MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measured Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
17.235	54.73	39.32	40.45	6.02	59.62	68.20	-8.58	Peak	Horizontal
17.235	38.63	39.32	40.45	6.02	43.52	54.00	-10.48	Average	Horizontal
17.235	53.43	39.32	40.45	6.02	58.32	68.20	-9.88	Peak	Vertical
17.235	38.34	39.32	40.45	6.02	43.23	54.00	-10.77	Average	Vertical

Channel 157 / 5785 MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measured Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
17.355	54.89	39.41	40.52	6.11	59.89	68.20	-8.31	Peak	Horizontal
17.355	39.73	39.41	40.52	6.11	44.73	54.00	-9.27	Average	Horizontal
17.355	54.22	39.41	40.52	6.11	59.22	68.20	-8.98	Peak	Vertical
17.355	37.42	39.41	40.52	6.11	42.42	54.00	-11.58	Average	Vertical

Channel 163 / 5825 MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measured Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
17.475	55.86	39.48	40.61	6.22	60.95	68.20	-7.25	Peak	Horizontal
17.475	39.80	39.48	40.61	6.22	44.89	54.00	-9.11	Average	Horizontal
17.475	54.11	39.48	40.61	6.22	59.20	68.20	-9.00	Peak	Vertical
17.475	37.76	39.48	40.61	6.22	42.85	54.00	-11.15	Average	Vertical

This report shall not be reproduced except in full, without the written approval of Shenzhen LCS Compliance Testing Laboratory Ltd.

IEEE 802.11ac VHT20/ Combined Antenna Chain 0 and Antenna Chain 1

Channel 149 / 5745 MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measured Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
17.235	54.56	39.32	40.45	6.02	59.45	68.20	-8.75	Peak	Horizontal
17.235	39.97	39.32	40.45	6.02	44.86	54.00	-9.14	Average	Horizontal
17.235	54.62	39.32	40.45	6.02	59.51	68.20	-8.69	Peak	Vertical
17.235	37.77	39.32	40.45	6.02	42.66	54.00	-11.34	Average	Vertical

Channel 157 / 5785 MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measured Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
17.355	54.04	39.41	40.52	6.11	59.04	68.20	-9.16	Peak	Horizontal
17.355	39.36	39.41	40.52	6.11	44.36	54.00	-9.64	Average	Horizontal
17.355	54.59	39.41	40.52	6.11	59.59	68.20	-8.61	Peak	Vertical
17.355	38.96	39.41	40.52	6.11	43.96	54.00	-10.04	Average	Vertical

Channel 163 / 5825 MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measured Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
17.475	55.48	39.48	40.61	6.22	60.57	68.20	-7.63	Peak	Horizontal
17.475	39.51	39.48	40.61	6.22	44.60	54.00	-9.40	Average	Horizontal
17.475	54.32	39.48	40.61	6.22	59.41	68.20	-8.79	Peak	Vertical
17.475	37.58	39.48	40.61	6.22	42.67	54.00	-11.33	Average	Vertical

This report shall not be reproduced except in full, without the written approval of Shenzhen LCS Compliance Testing Laboratory Ltd.

IEEE 802.11n HT40 / Antenna Chain 0 and Antenna Chain 1

Channel 151 / 5755 MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measured Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
17.265	55.54	39.32	40.45	6.02	60.43	68.20	-7.77	Peak	Horizontal
17.265	39.44	39.32	40.45	6.02	44.33	54.00	-9.67	Average	Horizontal
17.265	54.01	39.32	40.45	6.02	58.90	68.20	-9.30	Peak	Vertical
17.265	38.75	39.32	40.45	6.02	43.64	54.00	-10.36	Average	Vertical

Channel 159 / 5795 MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measured Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
17.385	54.21	39.41	40.52	6.11	59.21	68.20	-8.99	Peak	Horizontal
17.385	39.25	39.41	40.52	6.11	44.25	54.00	-9.75	Average	Horizontal
17.385	53.24	39.41	40.52	6.11	58.24	68.20	-9.96	Peak	Vertical
17.385	38.99	39.41	40.52	6.11	43.99	54.00	-10.01	Average	Vertical

IEEE 802.11ac VHT40 / Antenna Chain 0 and Antenna Chain 1

Channel 151 / 5755 MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measured Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
17.265	54.70	39.32	40.45	6.02	59.59	68.20	-8.61	Peak	Horizontal
17.265	39.23	39.32	40.45	6.02	44.12	54.00	-9.88	Average	Horizontal
17.265	54.25	39.32	40.45	6.02	59.14	68.20	-9.06	Peak	Vertical
17.265	37.42	39.32	40.45	6.02	42.31	54.00	-11.69	Average	Vertical

Channel 159 / 5795 MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measured Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
17.385	54.06	39.41	40.52	6.11	59.06	68.20	-9.14	Peak	Horizontal
17.385	38.19	39.41	40.52	6.11	43.19	54.00	-10.81	Average	Horizontal
17.385	53.15	39.41	40.52	6.11	58.15	68.20	-10.05	Peak	Vertical
17.385	37.76	39.41	40.52	6.11	42.76	54.00	-11.24	Average	Vertical

This report shall not be reproduced except in full, without the written approval of Shenzhen LCS Compliance Testing Laboratory Ltd.

IEEE 802.11ac VHT80 / Antenna Chain 0 and Antenna Chain 1

Channel 155 / 5775 MHz

Freq GHz	Read Level dBuV	Ant. Fac dB/m	Pre. Fac dB	Cab.Los dB	Measured Level dBuV	Limit Line dBuV/m	Over limit dB	Remark	Pol/Phase
17.325	55.41	39.32	40.45	6.02	60.30	68.2	-7.90	Peak	Horizontal
17.325	39.15	39.32	40.45	6.02	44.04	54.0	-9.96	Average	Horizontal
17.325	54.08	39.32	40.45	6.02	58.97	68.2	-9.23	Peak	Vertical
17.325	37.60	39.32	40.45	6.02	42.49	54.0	-11.51	Average	Vertical

Notes:

1. *Measuring frequencies from 9 KHz ~40 GHz, No emission found between lowest internal used/generated frequencies to 30MHz.*
2. *Radiated emissions measured in frequency range from 9 KHz ~40GHz were made with an instrument using Peak detector mode.*
3. *Data of measurement within this frequency range shown "---" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
4. *Worst case data at 6Mbps at IEEE 802.11a; MCS0 at IEEE 802.11n HT20, IEEE 802.11n HT40, IEEE 802.11a VHT20, IEEE 802.11ac VHT40 and IEEE 802.11ac VHT80;*

This report shall not be reproduced except in full, without the written approval of Shenzhen LCS Compliance Testing Laboratory Ltd.