FCC PART 15
TEST REPORT
No.I20Z61602-IOT07

for

Wingtech Group (Hong Kong) Limited

4G Mobile Broadband Router

TMOHS1

With

FCC ID: 2APXW-TMOHS1

Hardware Version: 89527_1_11

Software Version: TMOHS1_0.01.15

Issued Date: 2020-11-06

Note:

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Test Laboratory:

CTTL-Telecommunication Technology Labs, CAICT

No. 52, Huayuan North Road, Haidian District, Beijing, P. R. China 100191.

Tel:+86(0)10-62304633-2512, Fax:+86(0)10-62304633-2504

Email: cttl_terminals@caict.ac.cn, website: www.caict.ac.cn

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REPORT HISTORY

Report Number	Revision	Description	Issue Date
I20Z61602-IOT07	Rev.0	1st edition	2020-11-02
I20Z61602-IOT07	Rev.1	Update the information of General Description and reference documents on page 9.	2020-11-06

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1. TEST LATORATORY

1.1. Introduction & Accreditation

Telecommunication Technology Labs, CAICT is an ISO/IEC 17025:2005 accredited test laboratory under NATIONAL VOLUNTARY LABORATORY ACCREDITATION PROGRAM (NVLAP) with lab code 600118-0, and is also an FCC accredited test laboratory (CN5017), and ISED accredited test laboratory (CN0066). The detail accreditation scope can be found on NVLAP website.

1.2. Testing Location

Conducted testing Location: CTTL(huayuan North Road)

Address: No. 52, Huayuan North Road, Haidian District, Beijing, P. R. China100191

Radiated testing Location: CTTL(BDA)

Address: No.18A, Kangding Street, Beijing Economic-Technology Development Area, Beijing, P. R. China 100176

1.3. Testing Environment

Normal Temperature: 15-35℃

Relative Humidity: 20-75%

1.4. Project date

Testing Start Date: 2020-09-23

Testing End Date: 2020-11-02

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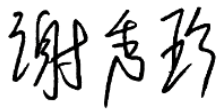
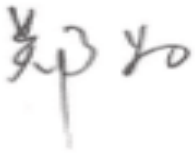
1.5. Signature



Xie Xiuzhen

(Prepared this test report)



Zheng Wei

(Reviewed this test report)

Hu Xiaoyu

(Approved this test report)

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2. CLIENT INFORMATION

2.1 Applicant Information

Company Name:	Wingtech Group (Hong Kong) Limited
Address:	Flat/RM 1903, 19/F, Podium Plaza 5 Hanoi Road, Tsim Sha Tsui Kowloon, Hong Kong
City:	Hong Kong
Postal Code:	/
Country:	China
Telephone:	/
Fax:	/

2.2 Manufacturer Information

Company Name:	Wingtech Group (Hong Kong) Limited
Address:	Flat/RM 1903, 19/F, Podium Plaza 5 Hanoi Road, Tsim Sha Tsui Kowloon, Hong Kong
City:	Hong Kong
Postal Code:	/
Country:	China
Telephone:	/
Fax:	/

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3. EQUIPMENT UNDER TEST (EUT) AND ANCILLARYEQUIPMENT(AE)

3.1. About EUT

Description	4G Mobile Broadband Router
Model name	TMOHS1
FCC ID	2APXW-TMOHS1
WLAN Frequency Band	ISM Bands: -5150MHz~5250MHz
Type of modulation	OFDM
Antenna	Integral Antenna
Voltage	3.85V

3.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version
EUT1	862448013592736	89527_1_11	TMOHS1_0.01.15
EUT2	862448013593593	89527_1_11	TMOHS1_0.01.15
EUT3	862448013594724	89527_1_11	TMOHS1_0.01.15

*EUT ID: is used to identify the test sample in the lab internally.

3.3. Internal Identification of AE used during the test

AE ID*	Description	SN
AE1	Battery	/
AE2	charger	/
AE3	USB cable	/

AE1

Type	MF01
Manufacturer	Jiade Energy Technology（Zhuhai）Co.,Ltd
Capacity	/
Nominal Voltage	/

AE2

Model	PA-US5V2A-036
Manufacturer	Huizhou puan electronics co., ltd
Length of cable	/

AE3

Type	USB TYPE A to C 2.0 Cable (1.0m)
Manufacturer	Huizhou Washin Electronics Co.,Ltd
Length of cable	/

*AE ID: is used to identify the test sample in the lab internally.

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3.4. General Description

The Equipment under Test (EUT) is a model of 4G Mobile Broadband Router with integrated antenna and inbuilt battery.

It consists of normal options: travel charger, USB cable.

Manual and specifications of the EUT were provided to fulfil the test.

Samples undergoing test were selected by the client.

3.5. Interpretation of the Test Environment

For the test methods, the test environment uncertainty figures correspond to an expansion factor k=2.

Measurement Uncertainty

Parameter	Uncertainty
temperature	0.48°C
humidity	2 %
DC voltages	0.003V

4. REFERENCE DOCUMENTS

4.1. Documents supplied by applicant

EUT feature information is supplied by the applicant or manufacturer, which is the basis of testing.

4.2. Reference Documents for testing

The following documents listed in this section are referred for testing.

FCC Part15	Title 47 of the Code of Federal Regulations; Chapter I Part 15 - Radio frequency devices	2018
ANSI C63.10	Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz	2013
UNII: KDB 789033 D02	General U-NII Test Procedures New Rules v02r01	2017-12

5. LABORATORY ENVIRONMENT

Conducted RF performance testing is performed in shielding room.

EMC performance testing is performed in Semi-anechoic chamber.

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6. SUMMARY OF TEST RESULTS

6.1. Summary of Test Results

SUMMARY OF MEASUREMENT RESULTS	Sub-clause of Part15E	Sub-clause of IC	Verdict
Maximum Output Power	15.407	/	**P**
Peak Power Spectral Density	15.407	/	**P**
Occupied 26dB Bandwidth	15.403	/	**P**
Band edge compliance (Radiated)	15.209	/	**P**
Transmitter spurious emissions (Radiated)	15.407	/	**P**
AC Powerline Conducted Emission (150kHz- 30MHz)	15.407	/	**P**
99% Occupied bandwidth	/	/	**P**
Transmit Power Control	15.407	/	**NA**

Please refer to **ANNEX A** for detail.

Terms used in Verdict column

P	Pass, The EUT complies with the essential requirements in the standard.
NM	Not measured, The test was not measured by CTTL
NA	Not Applicable, The test was not applicable
F	Fail, The EUT does not comply with the essential requirements in the standard

6.2. Statements

CTTL has evaluated the test cases requested by the client/manufacturer as listed in section 6.1 of this report for the EUT specified in section 3 according to the standards or reference documents listed in section 4.1.

This report only deals with the WLAN function among the features described in section 3.

6.3. Test Conditions

For this report, all the test cases are tested under normal temperature and normal voltage, and also under norm humidity, the specific condition is shown as follows:

Temperature	26□
Voltage	3.85V
Humidity	44%

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7. TEST EQUIPMENTS UTILIZED

Conducted test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Period	Calibration Due date
1	Vector Signal Analyzer	FSQ40	200089	Rohde & Schwarz	1 year	2021-05-06
2	LISN	ENV216	101459	R&S	1 year	2021-03-17
3	Test Receiver	ESCI	100766	R&S	1 year	2021-03-10
4	Shielding Room	S81	/	ETS-Lindgren	/	/

Radiated emission test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Period	Calibration Due date
1	Test Receiver	ESU26	100376	Rohde & Schwarz	1 year	2021-09-04
2	BiLog Antenna	VULB9163	9163-514	Schwarzbeck	1 year	2021-02-24
3	Dual-Ridge Waveguide Horn Antenna	3117	00058888	ETS-Lindgren	1 year	2021-04-08
4	Dual-Ridge Waveguide Horn Antenna	3116	2663	ETS-Lindgren	1 year	2021-08-05
5	Vector Signal Analyzer	FSV40	101047	Rohde & Schwarz	1 year	2021-05-18

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8. Measurement Uncertainty

8.1 Transmitter Output Power

Measurement Uncertainty: 0.387dB,k=1.96

8.2 Peak Power Spectral Density

Measurement Uncertainty: 0.705dB,k=1.96

8.3 Occupied Channel Bandwidth

Measurement Uncertainty: 60.80Hz,k=1.96

8.4 Band Edges Compliance

Measurement Uncertainty : 0.62dB,k=1.96

8.5 Spurious Emissions

Conducted (k=1.96)

Frequency Range	Uncertainty(dB)
30MHz ≤ f ≤ 2GHz	1.22
2GHz ≤ f ≤3.6GHz	1.22
3.6GHz ≤ f ≤8GHz	1.22
8GHz ≤ f ≤12.75GHz	1.51
12.75GHz ≤ f ≤26GHz	1.51
26GHz ≤ f ≤40GHz	1.59

Radiated (k=2)

Frequency Range	Uncertainty(dB)
9kHz-30MHz	/
30MHz ≤ f ≤ 1GHz	5.40
1GHz ≤ f ≤18GHz	4.32
18GHz ≤ f ≤40GHz	5.26

8.6 AC Power-line Conducted Emission

Measurement Uncertainty : 3.10dB,k=2

ANNEX A: EUT parameters

Disclaimer: the worse case provided by the client may affect the validity of the measurement results in this report, and the client shall bear the impact and consequences arising therefrom.

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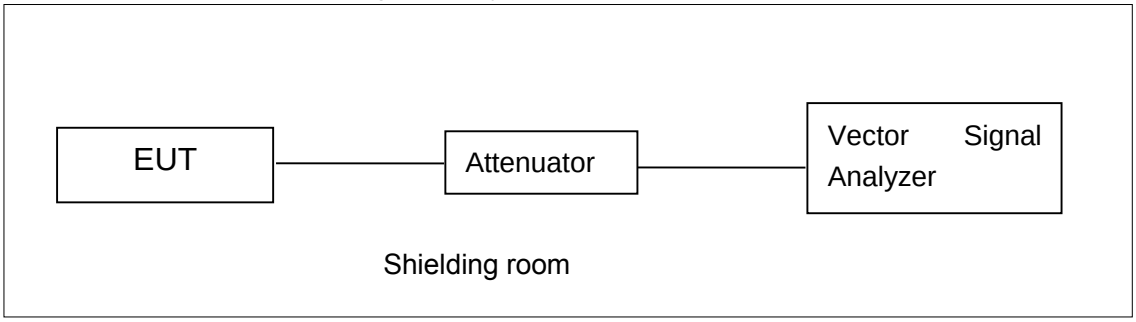
ANNEX B: MEASUREMENT RESULTS

B.1. Measurement Method

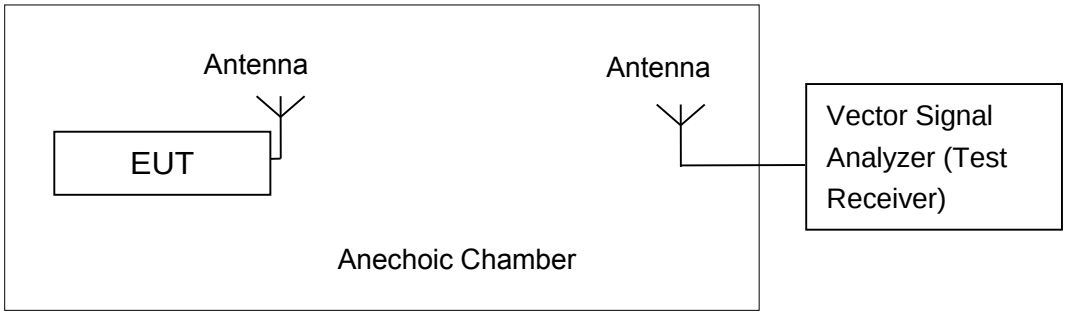
B.1.1. Conducted Measurements

1). Connect the EUT to the test system correctly.
2). Set the EUT to the required work mode.
3). Set the EUT to the required channel.
4). Set the spectrum analyzer to start measurement.
5). Record the values. Vector Signal Analyzer



B.1.2. Radiated Emission Measurements

In the case of radiated emission, the used settings are as follows,
Sweep frequency from 30 MHz to 1GHz, RBW = 100 kHz, VBW = 300 kHz;
Sweep frequency from 1 GHz to 26GHz, RBW = 1MHz, VBW = 10Hz;



The measurement is made according to KDB 789033
The radiated emission test is performed in semi-anechoic chamber. The distance from the EUT to the reference point of measurement antenna is 3m. The test is carried out on both vertical and horizontal polarization and only maximization result of both polarizations is kept. During the test, the turntable is rotated 360° and the measurement antenna is moved from 1m to 4m to get the maximization result.

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B.2. Maximum output Power

Measurement Limit and Method:

Standard	Frequency (MHz)	Limit (dBm)
FCC CRF Part 15.407(a)	5150MHz~5250MHz	24dBm

Limit use the less value, and B is the 26dB bandwidth.

The measurementmethod SA-2 is made according to KDB 789033

Measurement Results:

802.11a mode

Mode	Data Rate	Test Result (dBm)		
		Frequency		
		5180MHz	5200MHz	5240MHz
802.11a	6Mbps	19.64	19.67	19.49

The data rate 6Mbps is selected as worse condition, and the following cases are performed with this condition.

802.11n-HT20 mode

Mode	Data Rate	Test Result (dBm)		
		Frequency		
		5180MHz	5200MHz	5240MHz
802.11n-HT20	MCS0	18.37	18.40	18.21

The data rate MCS0 is selected as worse condition, and the following cases are performed with this condition.

802.11ac-HT20 mode

Mode	Data Rate	Test Result (dBm)		
		Frequency		
		5180MHz	5200MHz	5240MHz
802.11ac-HT20	MCS0	18.36	18.41	18.21

The data rate MCS0 is selected as worse condition, and the following cases are performed with this condition.

802.11n-HT40 mode

Mode	Data Rate	Test Result (dBm)	
		Frequency	
		5190MHz	5230MHz
802.11n-HT40	MCS0	17.06	18.69

The data rate MCS0 is selected as worse condition, and the following cases are performed with this condition.

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802.11ac-HT40 mode

Mode	Data Rate	Test Result (dBm)	
		Frequency	
		5190MHz	5230MHz
802.11ac-HT40	MCS0	15.98	18.69

The data rate MCS0 is selected as worse condition, and the following cases are performed with this condition.

802.11ac-HT80 mode

Mode	Data Rate	Test Result (dBm)
		Frequency
		5210MHz
802.11ac-HT80	MCS0	16.02

The data rate MCS0 is selected as worse condition, and the following cases are performed with this condition.

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B.3. Peak Power Spectral Density (conducted)

Measurement Limit:

Standard	Frequency (MHz)	Limit (dBm/MHz)
FCC CRF Part 15.407(a)	5150MHz~5250MHz	11

The output power measurement method Section F is made according to KDB 789033

Measurement Results:

Mode	Frequency	Power Spectral Density (dBm/MHz)	Conclusion
802.11a	5180 MHz	9.77	P
	5200 MHz	9.68	P
	5240 MHz	9.81	P
802.11n HT20	5180 MHz	8.37	P
	5200 MHz	8.34	P
	5240 MHz	8.43	P
802.11ac HT20	5180 MHz	8.38	P
	5200 MHz	8.33	P
	5240 MHz	8.44	P
802.11n HT40	5190 MHz	2.89	P
	5230 MHz	5.93	P
802.11ac HT40	5190 MHz	2.37	P
	5230 MHz	5.95	P
802.11ac HT80	5210MHz	-0.23	P

Conclusion: PASS

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B.4. Occupied 26dB Bandwidth(conducted)

Measurement Limit:

Standard	Limit (kHz)
FCC 47 CFR Part 15.403 (i)	/

The measurement is made according to KDB 789033

Measurement Uncertainty:

Measurement Uncertainty	60.80Hz

Measurement Result:

Mode	Frequency	Occupied 26dB Bandwidth (MHz)		conclusion
802.11a	5180 MHz	Fig.1	20.70	P
	5200 MHz	Fig.2	20.70	P
	5240 MHz	Fig.3	20.65	P
802.11n HT20	5180 MHz	Fig.4	20.55	P
	5200 MHz	Fig.5	21.15	P
	5240 MHz	Fig.6	21.05	P
802.11ac HT20	5180 MHz	Fig.7	21.05	P
	5200 MHz	Fig.8	21.15	P
	5240 MHz	Fig.9	21.10	P
802.11n HT40	5190 MHz	Fig.10	41.36	P
	5230 MHz	Fig.11	41.36	P
802.11ac HT40	5190 MHz	Fig.12	41.44	P
	5230 MHz	Fig.13	41.20	P
802.11ac HT80	5210MHz	Fig.14	83.68	P

Conclusion: PASS

Test graphs as below:

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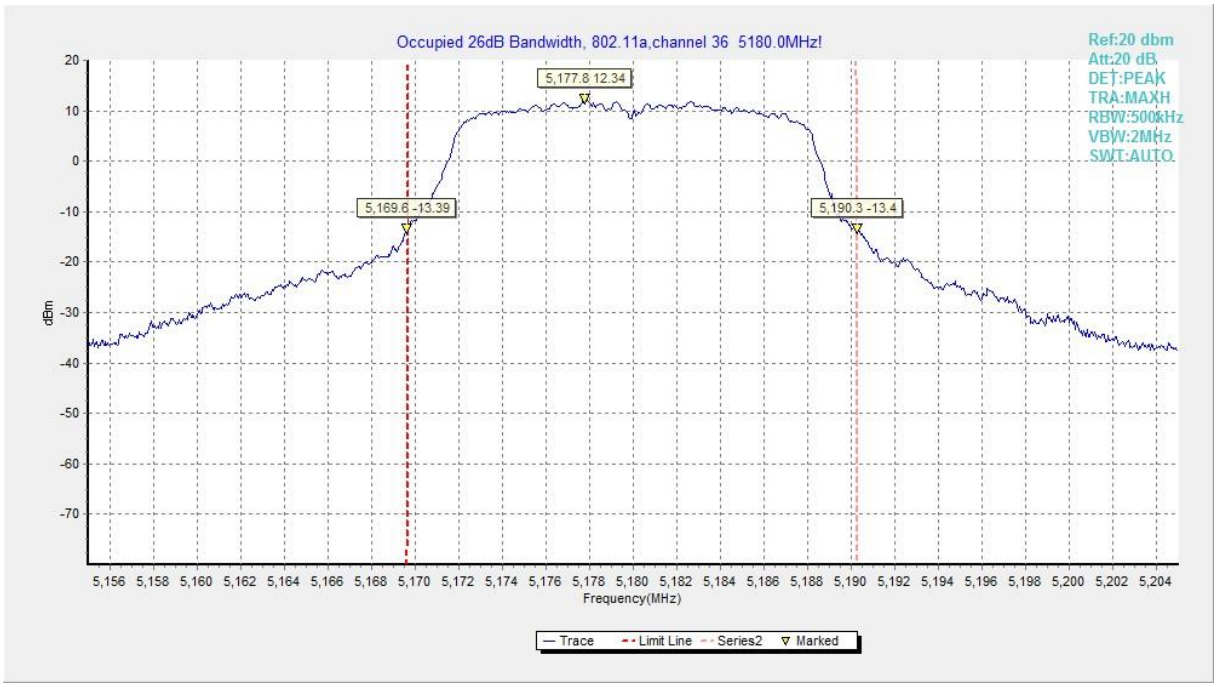

Fig.1 Occupied 26dB Bandwidth (802.11a, 5180MHz)

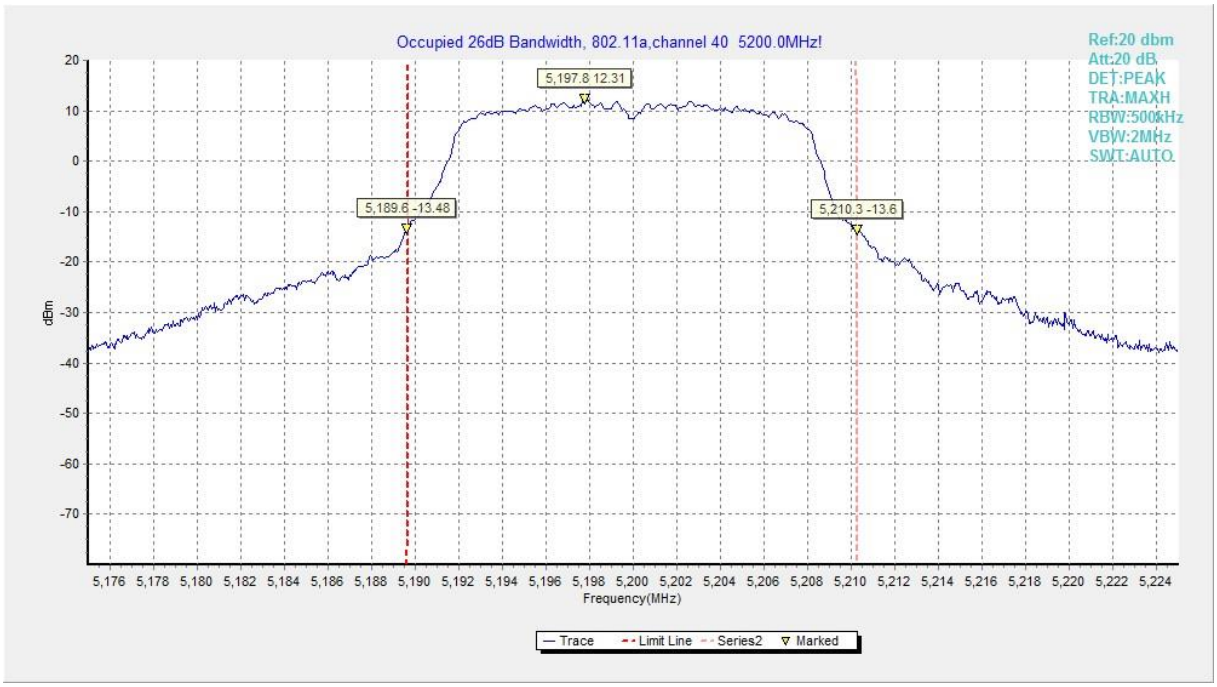

Fig.2 Occupied 26dB Bandwidth (802.11a, 5200MHz)

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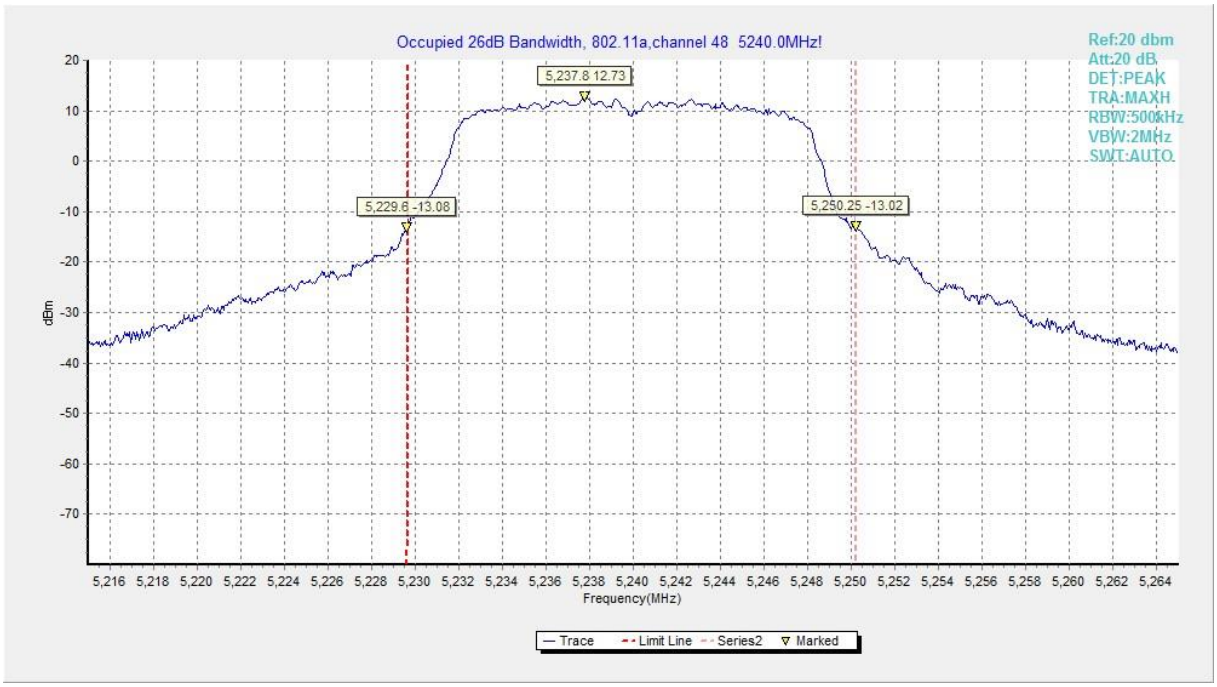

Fig.3 Occupied 26dB Bandwidth (802.11a, 5240MHz)

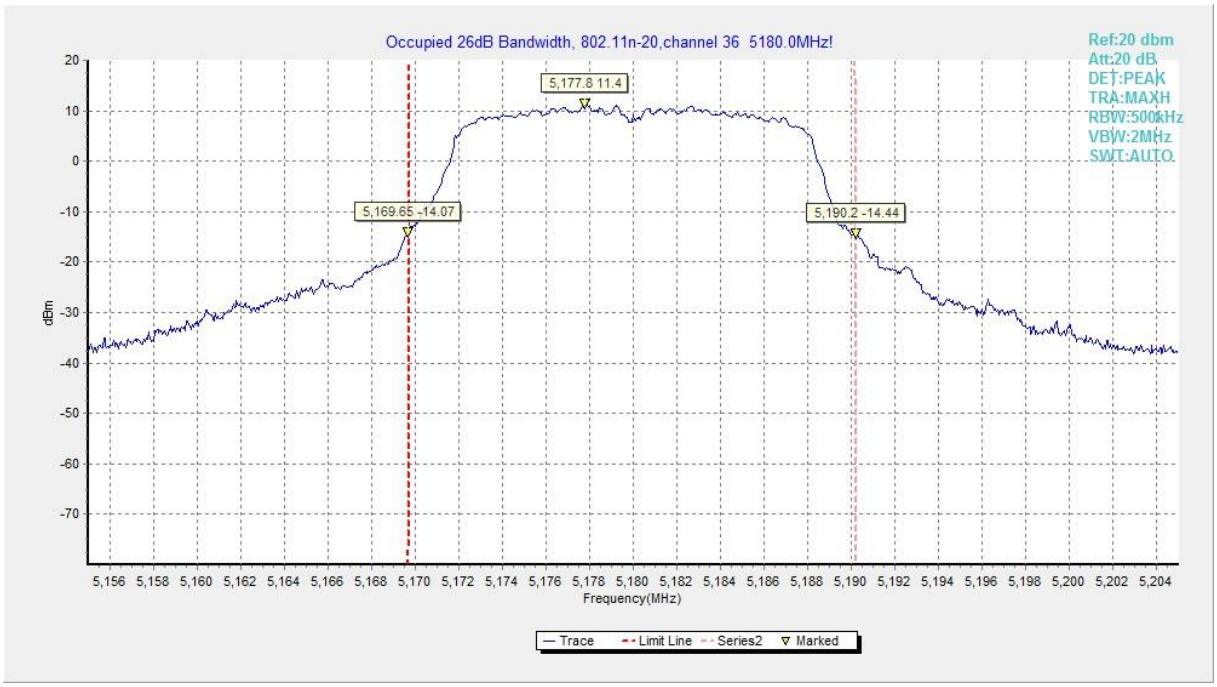

Fig.4 Occupied 26dB Bandwidth (802.11n-HT20, 5180MHz)

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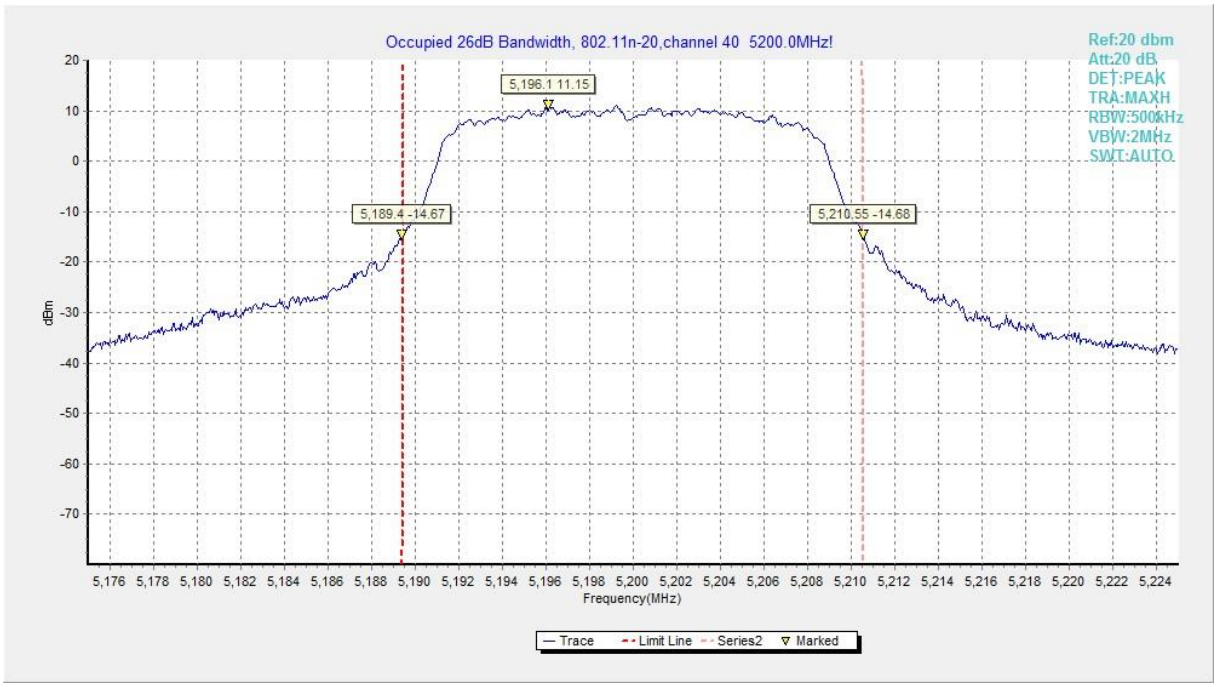

Fig.5 Occupied 26dB Bandwidth (802.11n-HT20, 5200MHz)

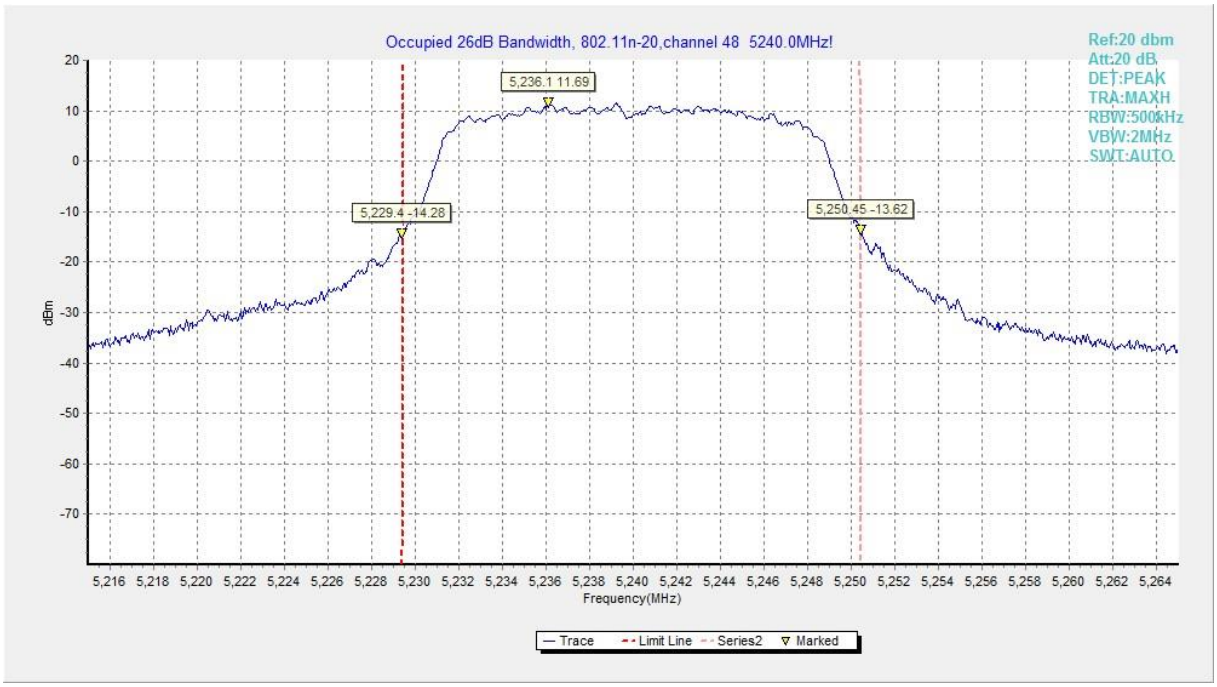

Fig.6 Occupied 26dB Bandwidth (802.11n-HT20, 5240MHz)

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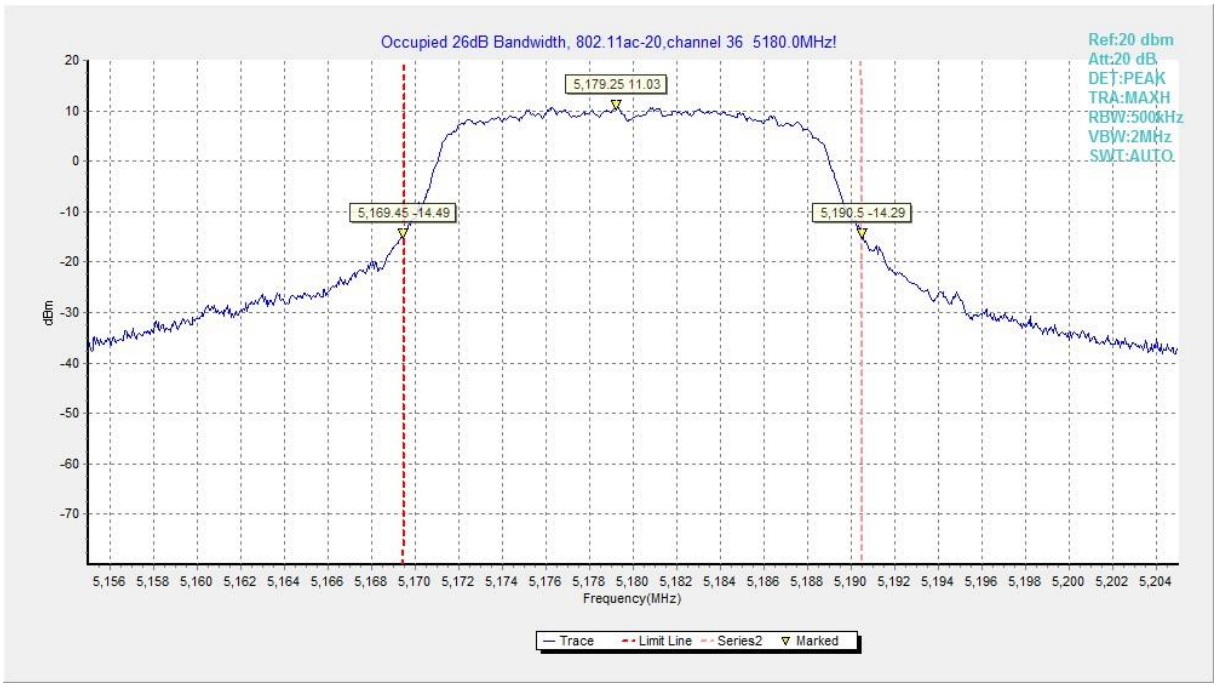

Fig.7 Occupied 26dB Bandwidth (802.11ac-HT20, 5180MHz)

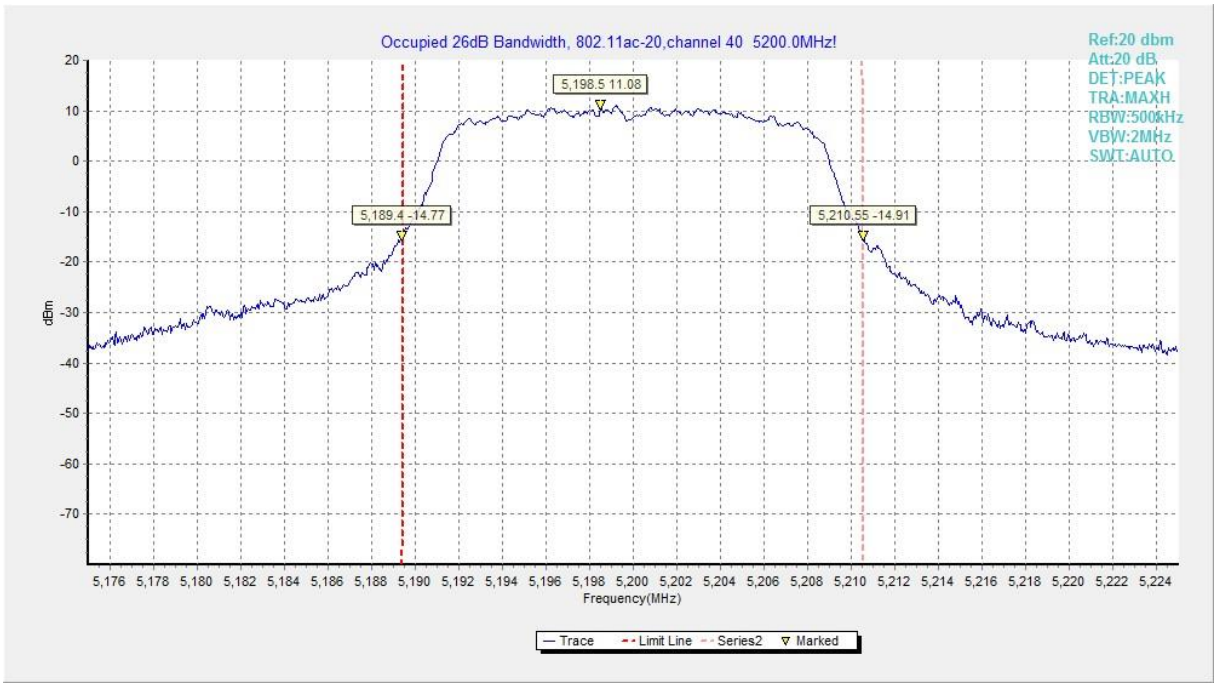

Fig.8 Occupied 26dB Bandwidth (802.11ac-HT20, 5200MHz)

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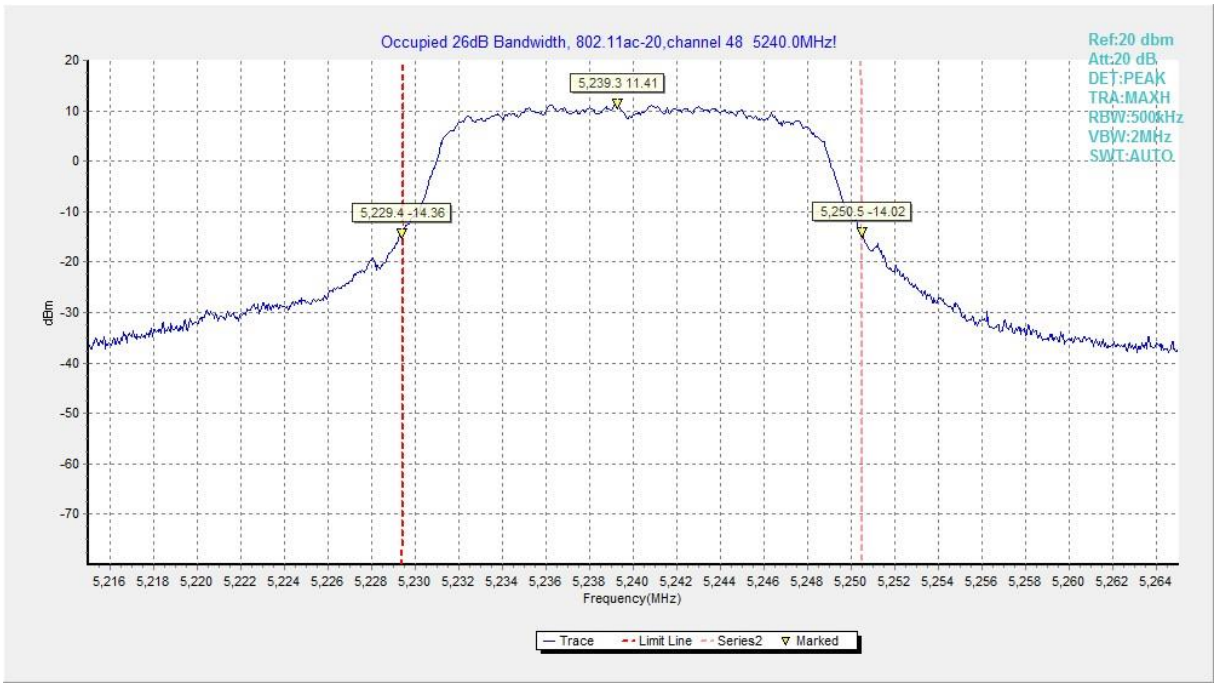

Fig.9 Occupied 26dB Bandwidth (802.11ac-HT20, 5240MHz)

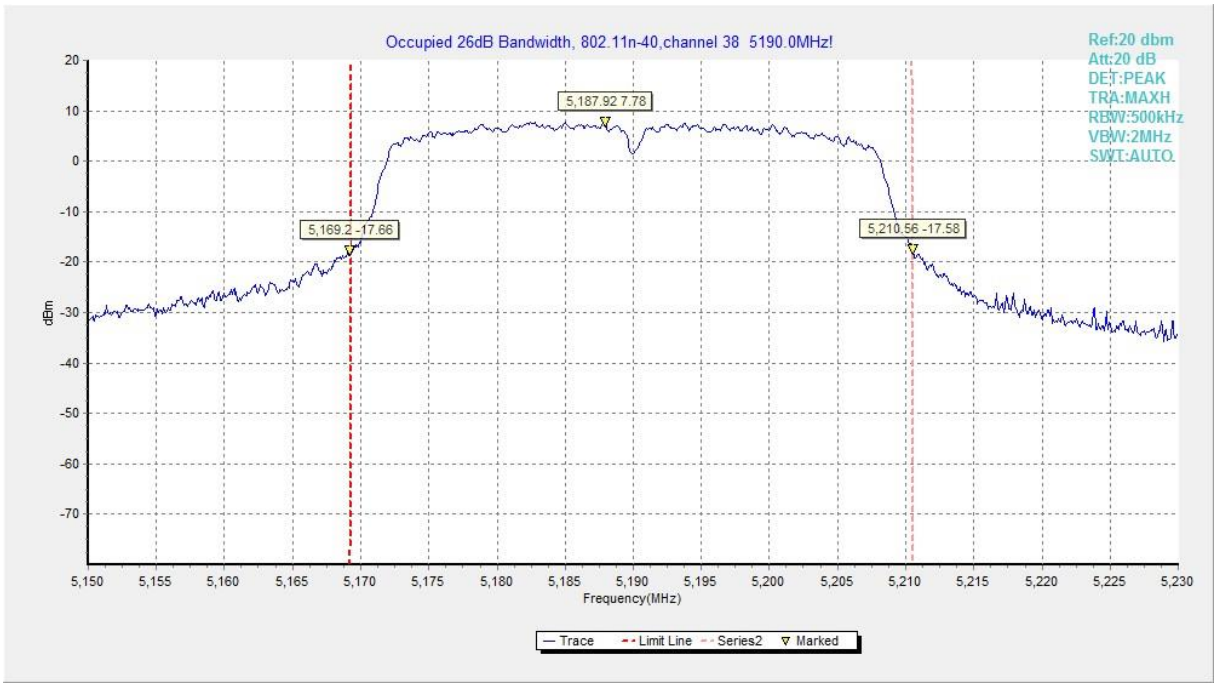

Fig.10 Occupied 26dB Bandwidth (802.11n-HT40, 5190MHz)

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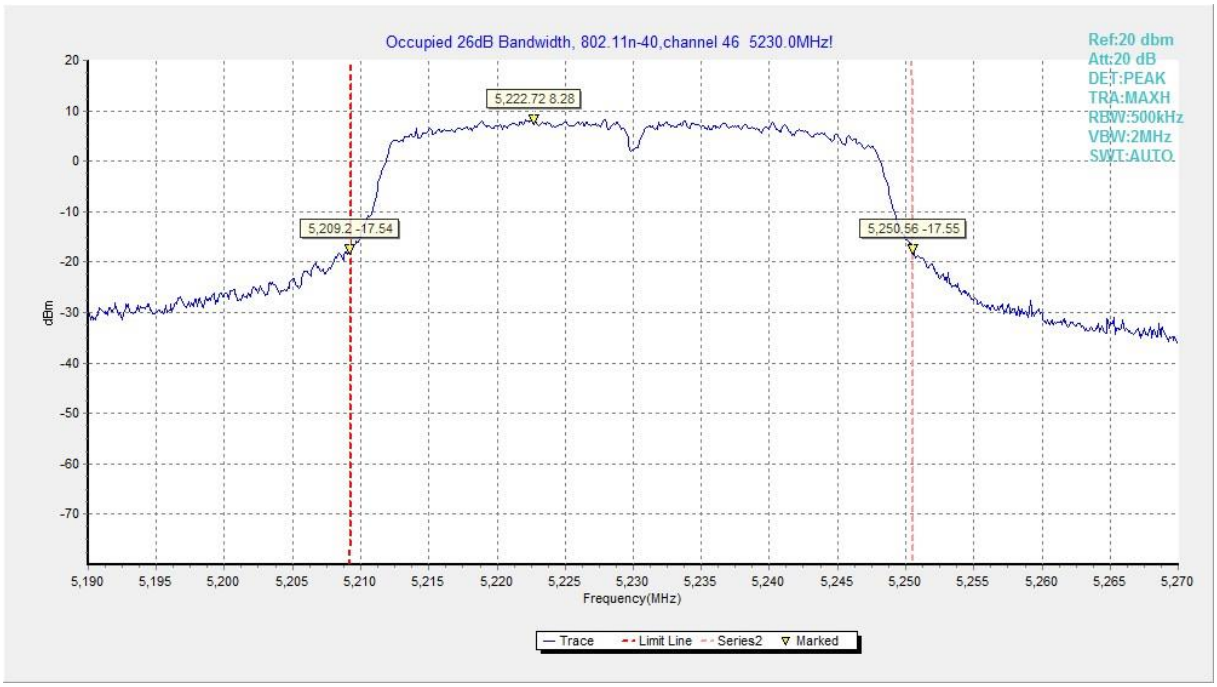

Fig.11 Occupied 26dB Bandwidth (802.11n-HT40, 5230MHz)

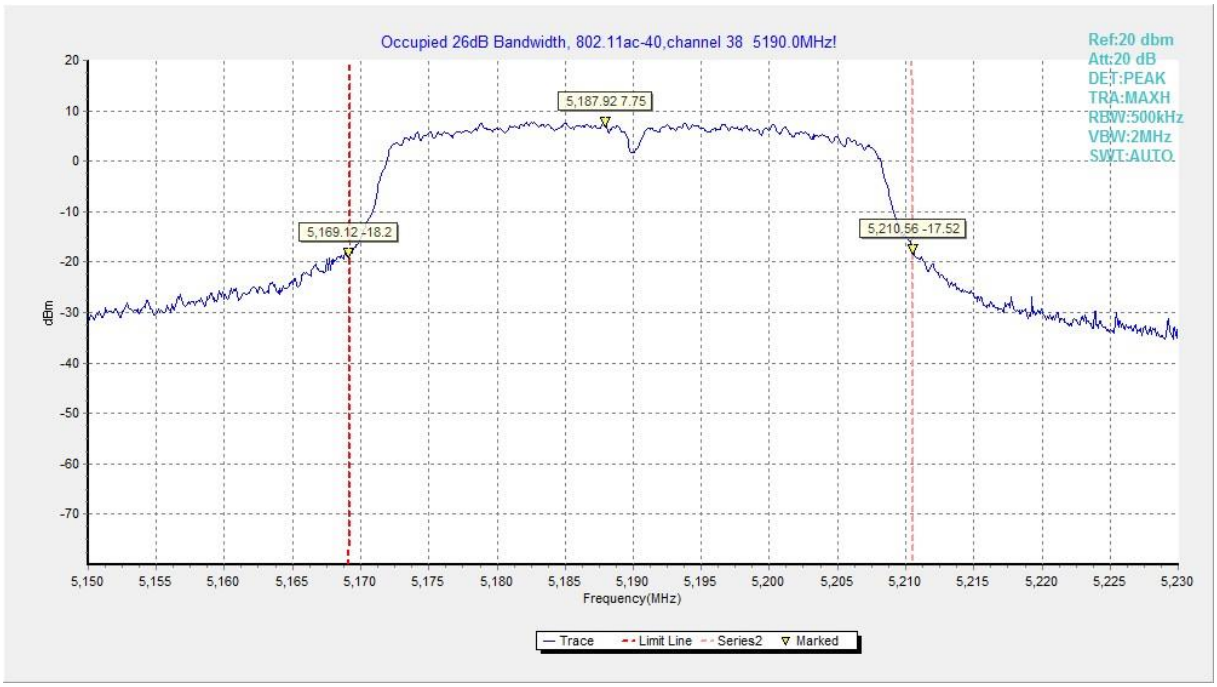

Fig.12 Occupied 26dB Bandwidth (802.11ac-HT40, 5190MHz)

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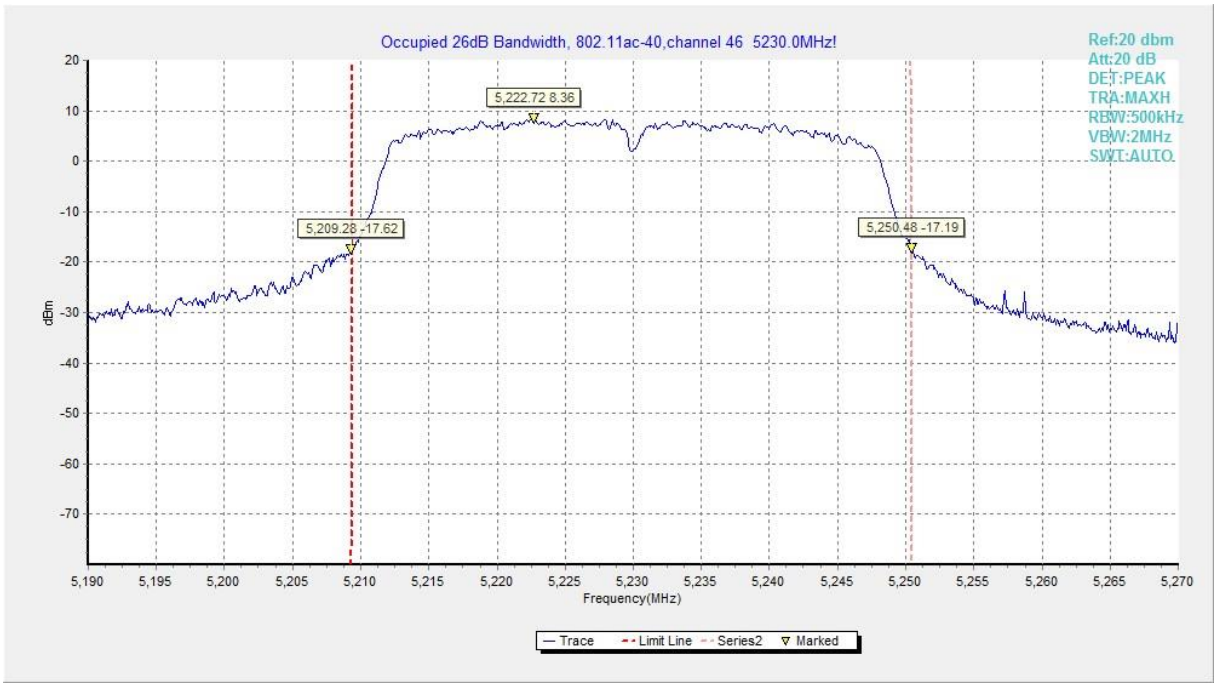

Fig.13 Occupied 26dB Bandwidth (802.11ac-HT40, 5230MHz)

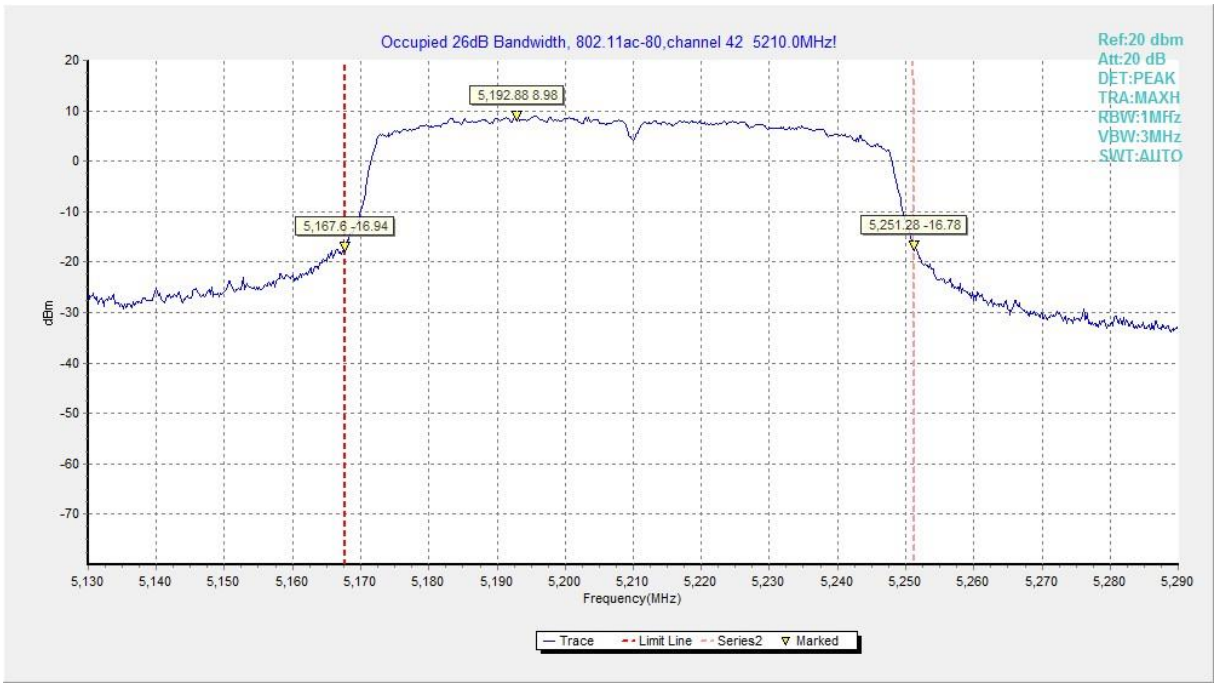

Fig.14 Occupied 26dB Bandwidth (802. 11ac-HT80, 5210MHz)

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B.5. Band Edges Compliance

B.5.1 Band Edges - Radiated

Measurement Limit:

Standard	Limit
FCC 47 CFR Part 15.407	-27 dBm/MHz

The measurement is made according to KDB 789033

In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

Measurement Uncertainty:

Measurement Uncertainty	0.75dB

Measurement Result:

Mode	Channel	Test Results	Conclusion
802.11a	5180 MHz	Fig.15	P
	5240 MHz	Fig.16	P
802.11n HT20	5180 MHz	Fig.17	P
	5240 MHz	Fig.18	P
802.11n HT40	5190 MHz	Fig.19	P
	5230 MHz	Fig.20	P
	5230 MHz	Fig.21	
802.11ac HT20	5180 MHz	Fig.22	P
	5240 MHz	Fig.23	P
802.11ac HT40	5190 MHz	Fig.24	P
	5230 MHz	Fig.25	P
	5230 MHz	Fig.26	P
802.11ac HT80	5210 MHz	Fig.27	P
	5210 MHz	Fig.28	P

Conclusion: PASS

Test graphs as below:

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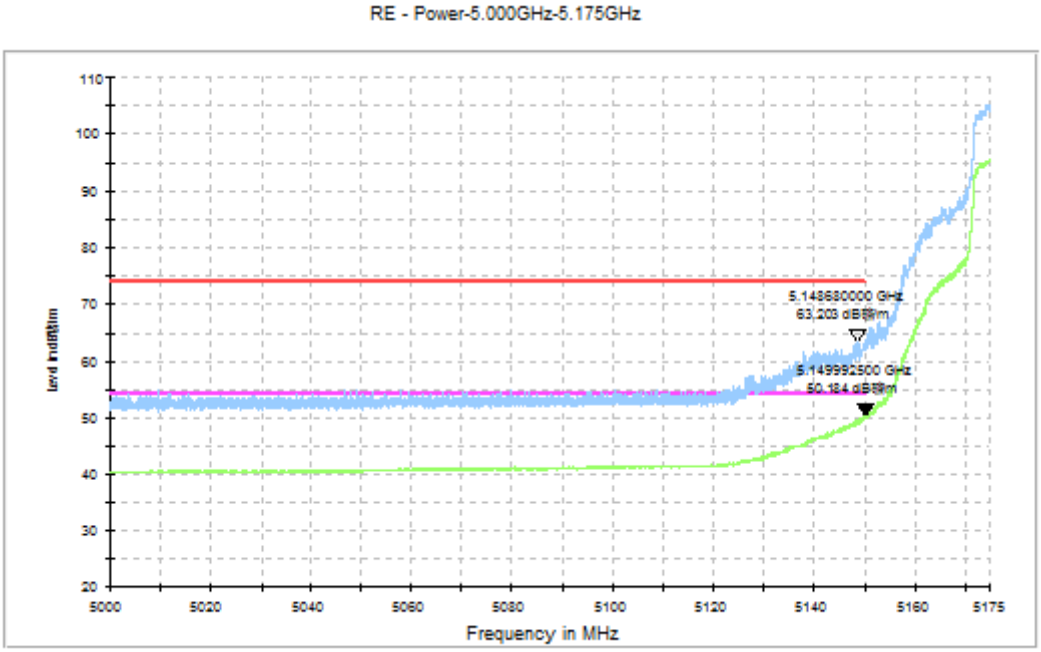

Fig.15 Band Edges (802.11a, 5180MHz)

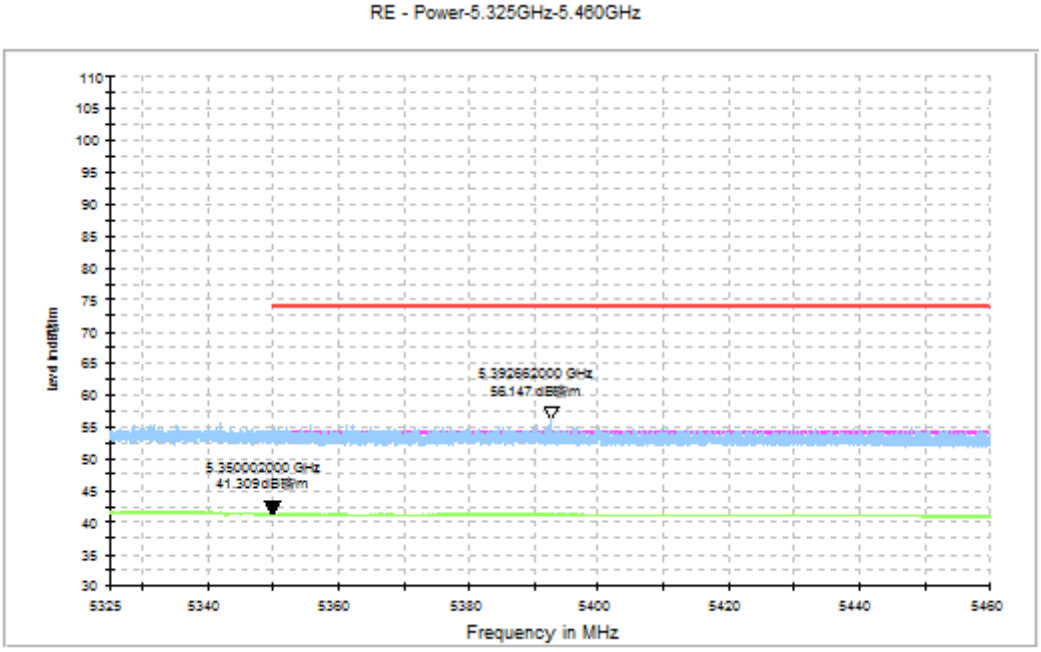

Fig.16 Band Edges (802.11a, 5240MHz)

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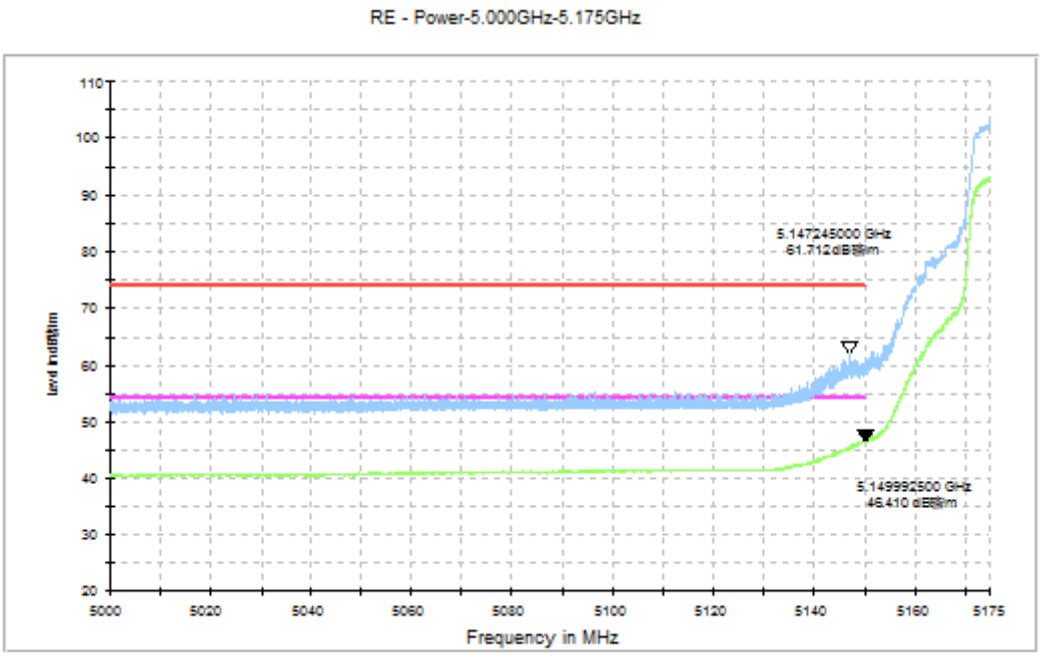

Fig.17 Band Edges (802.11n-HT20, 5180MHz)

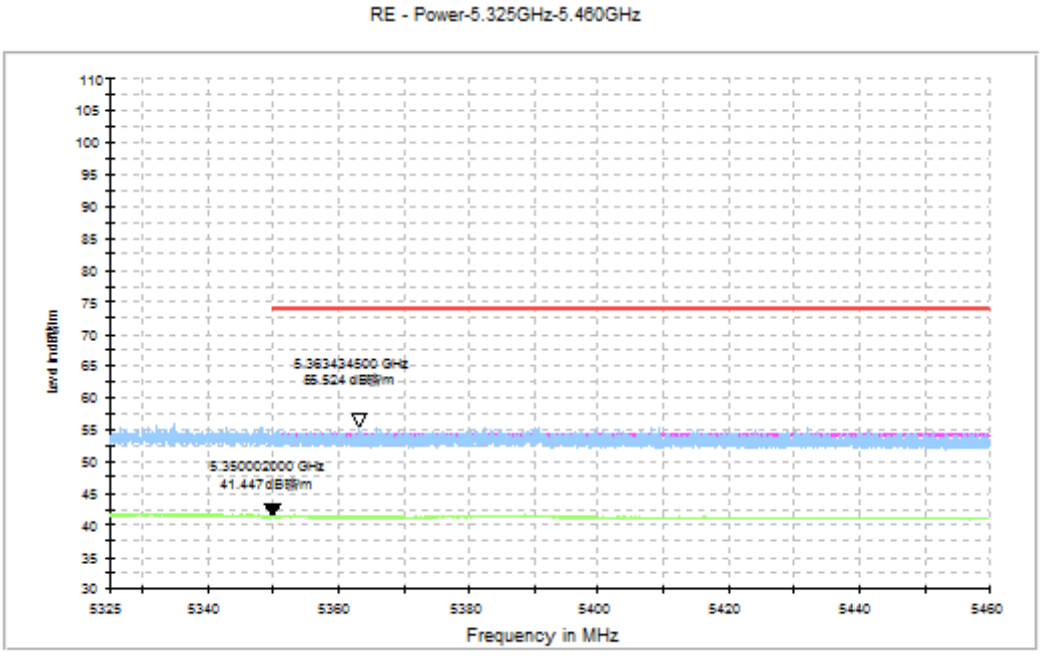

Fig.18 Band Edges (802.11n-HT20, 5240MHz)

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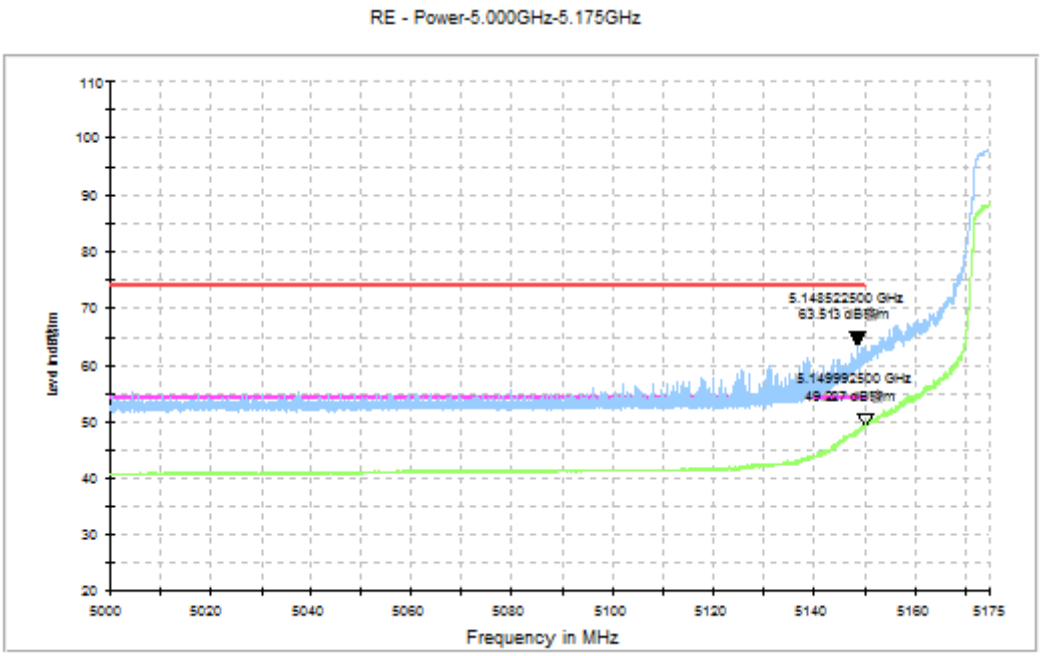

Fig.19 Band Edges (802.11n-HT40, 5190MHz)

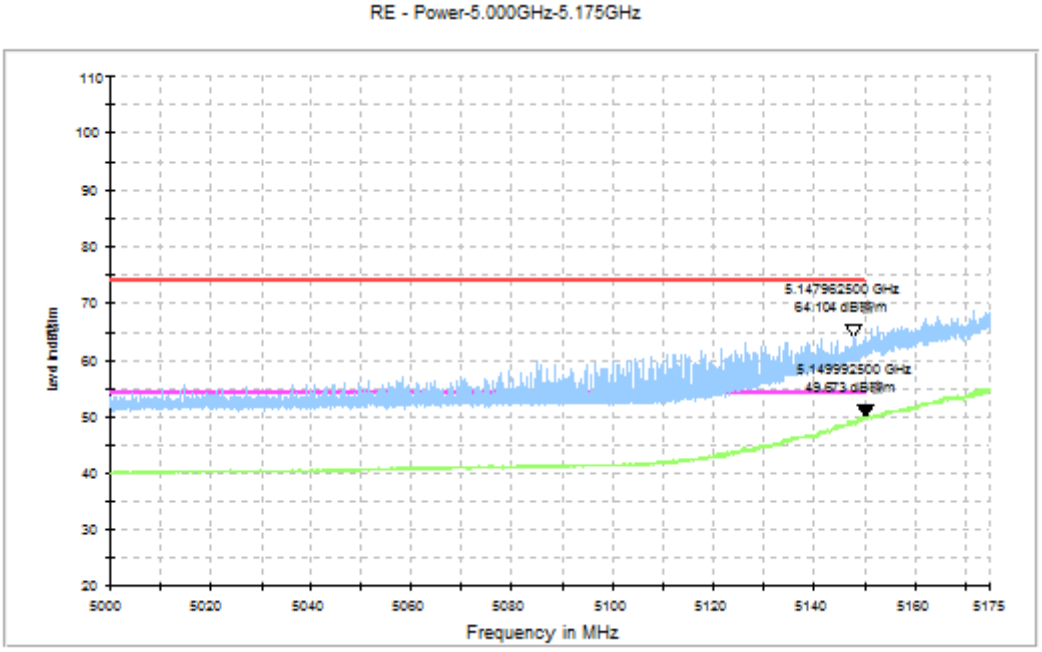

Fig.20 Band Edges (802.11n-HT40, 5230MHz)

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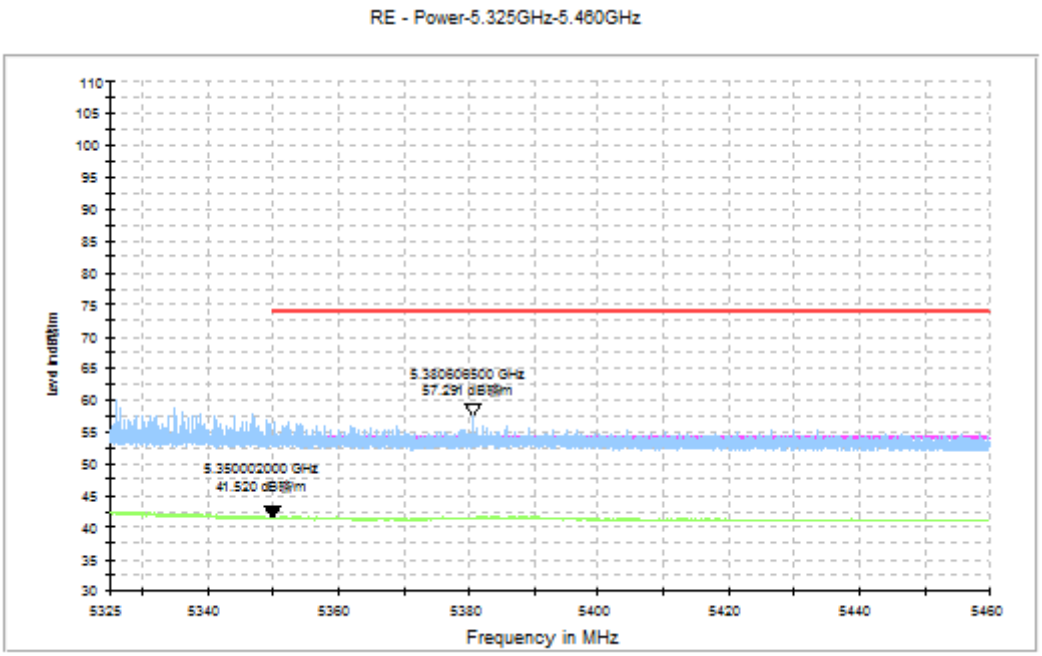

Fig.21 Band Edges (802.11n-HT40, 5230MHz)

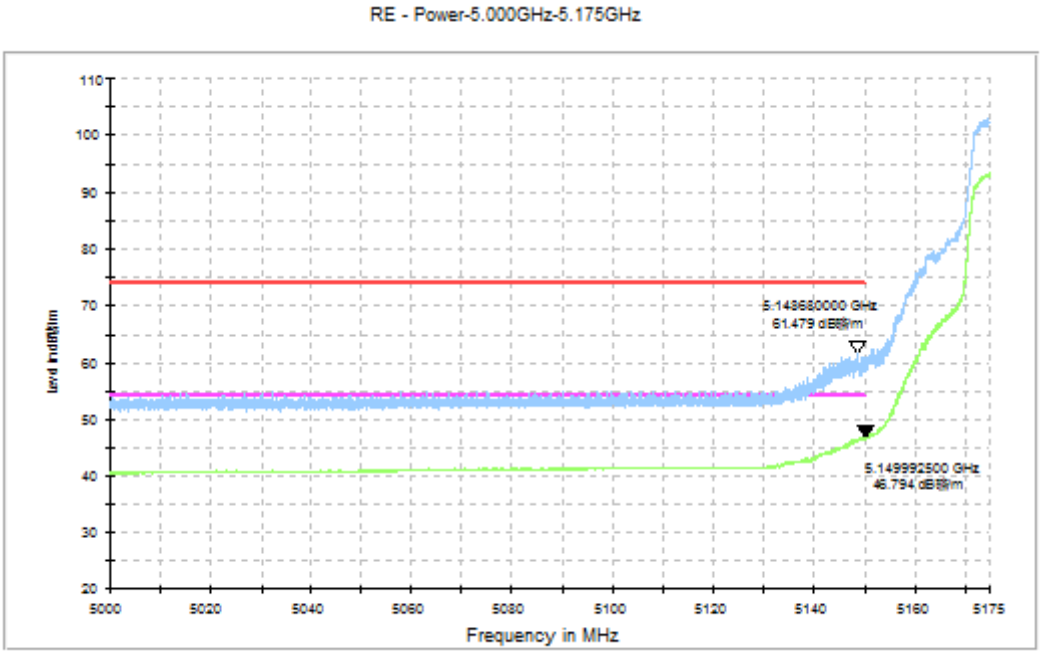

Fig.22 Band Edges (802.11ac-HT20, 5180MHz)

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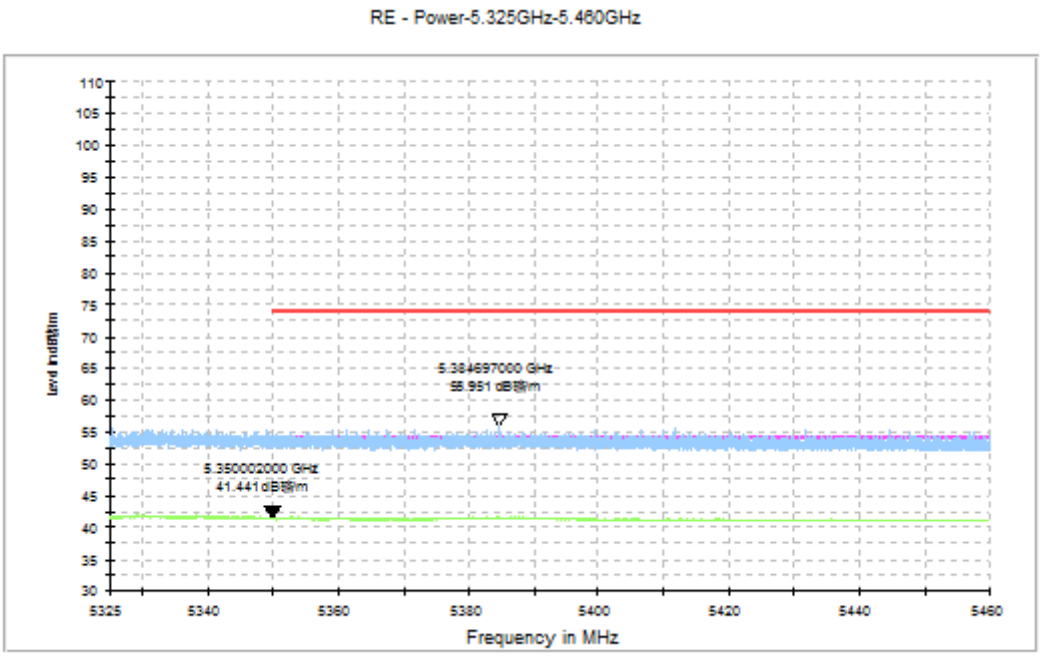

Fig.23 Band Edges (802.11ac-HT20, 5240MHz)

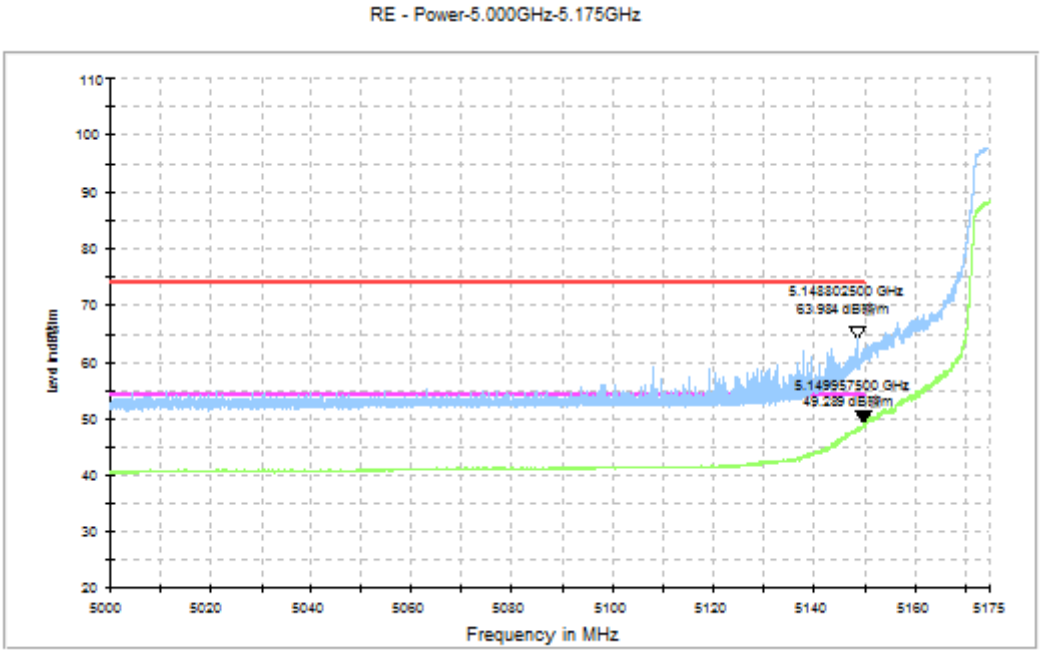

Fig.24 Band Edges (802.11ac-HT40, 5190MHz)

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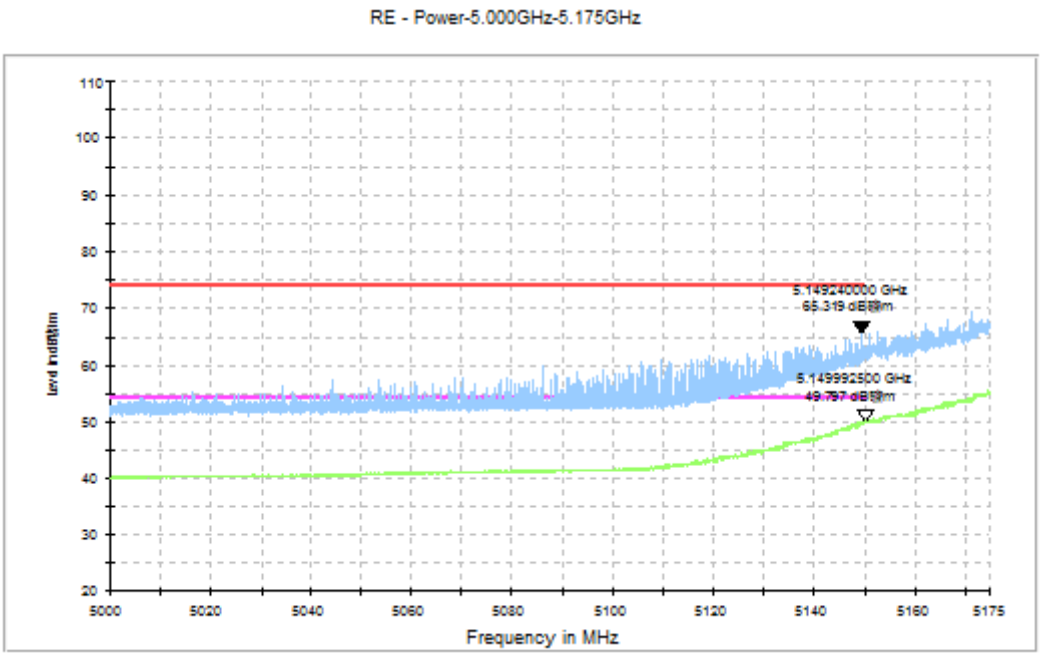

Fig.25 Band Edges (802.11ac-HT40, 5230MHz)

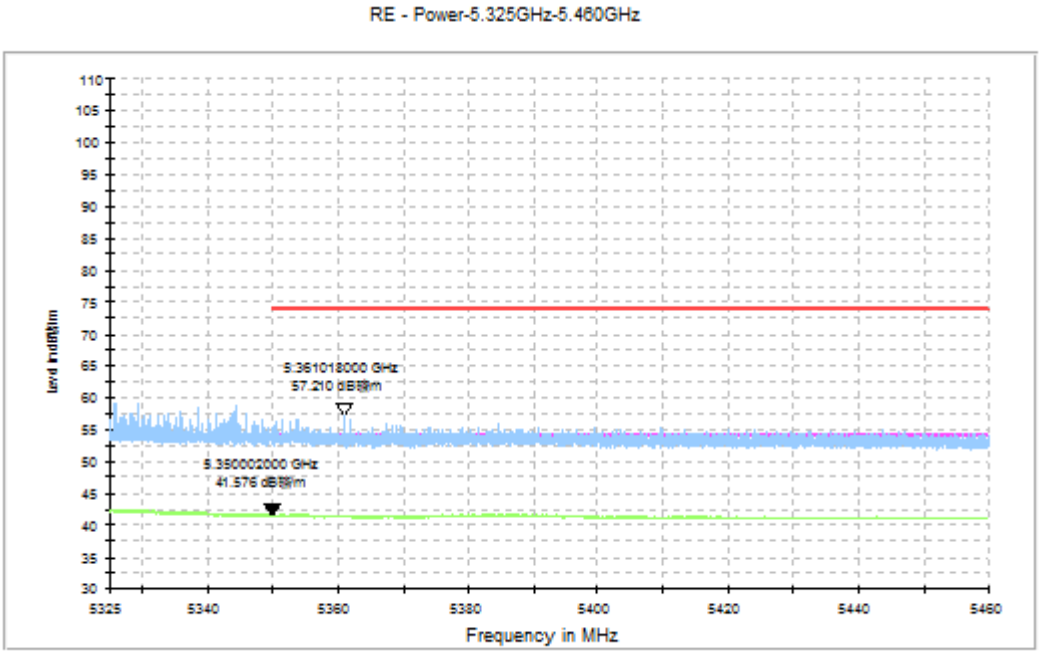

Fig.26 Band Edges (802.11ac-HT40, 5230MHz)

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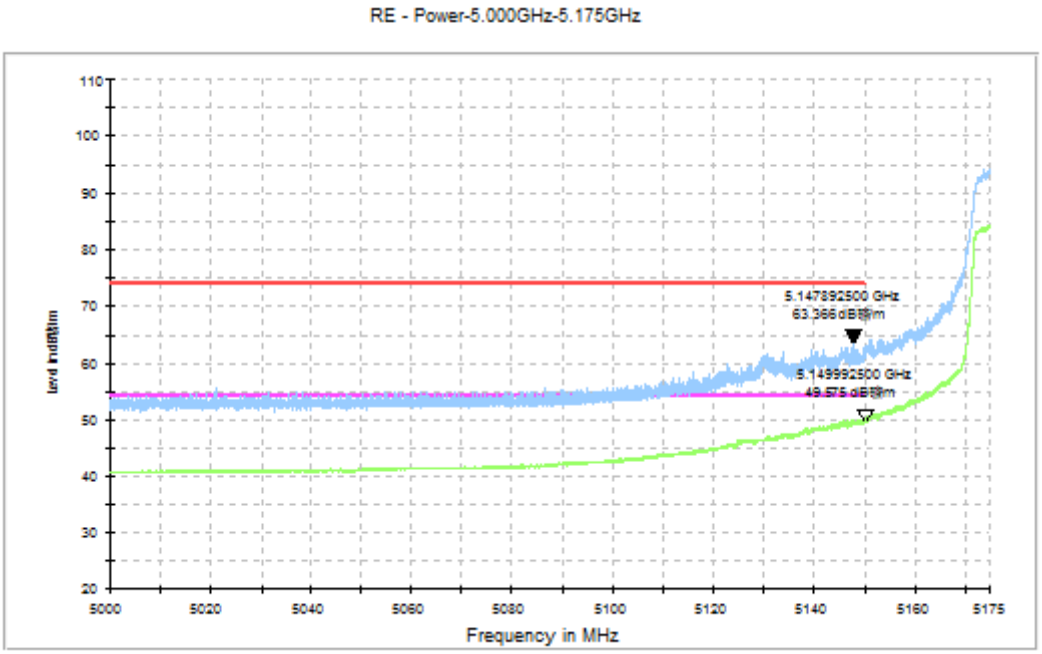

Fig.27 Band Edges (802.11ac-HT80, 5210MHz)

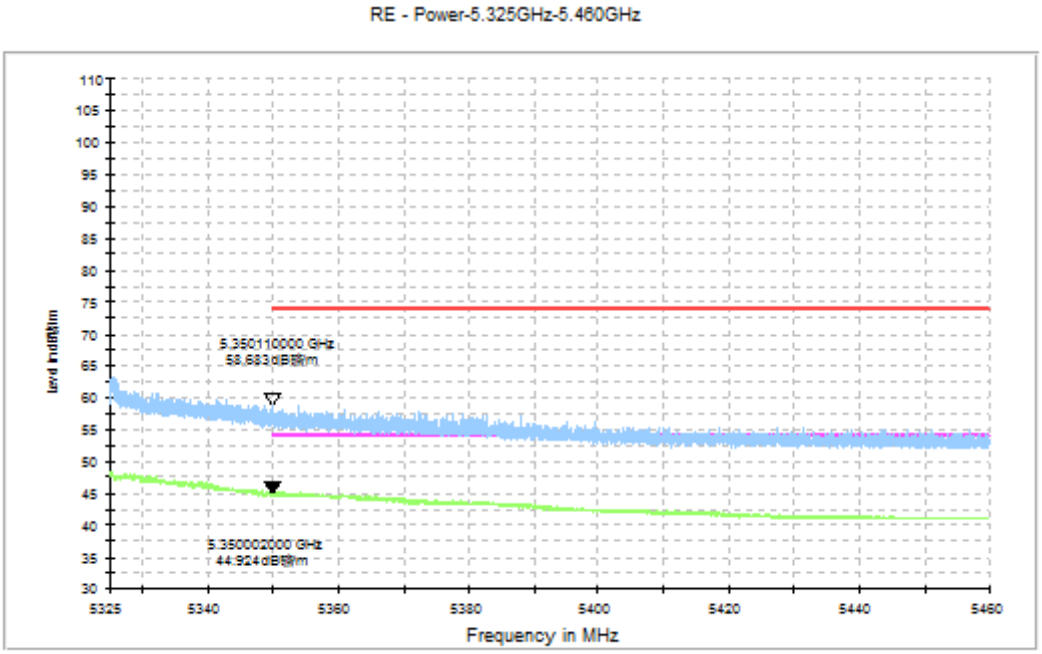

Fig.28 Band Edges (802.11ac-HT80, 5210MHz)

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B.6. Transmitter Spurious Emission

Measurement Limit:

Standard	Limit
FCC 47 CFR Part 15.407	-27 dBm/MHz

The measurement is made according to KDB 789033

In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

Limit in restricted band:

Frequency of emission (MHz)	Field strength(dBμV/m)	Measurement distance(m)
30-88	40.0	3
88-216	43.5	3
216-960	46.0	3
Above 960	54.0	3

Note: for frequency range below 960MHz, the limit in 15.209 is defined in 10m test distance. The limit used above is calculated from 10m to 3m

Measurement Results:

802.11a mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11a	36(5180MHz)	1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
		7 GHz ~ 18 GHz	---	P
	40(5200MHz)	30 MHz ~1 GHz	---	P
		1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
		7 GHz ~ 18 GHz	---	P
		18 GHz ~ 26.5 GHz	---	P
		26.5 GHz ~ 40 GHz	---	P
	48(5240MHz)	1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
		7 GHz ~ 18 GHz	---	P

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802.11n-HT20 mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11n - HT20	36(5180MHz)	1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
		7 GHz ~ 18 GHz	---	P
	40(5200MHz)	30 MHz ~1 GHz	---	P
		1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
		7 GHz ~ 18 GHz	---	P
		18 GHz ~ 26.5 GHz	---	P
		26.5 GHz ~ 40 GHz	---	P
	48(5240MHz)	1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
		7 GHz ~ 18 GHz	---	P

802.11n-HT40 mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11n HT40	38(5190MHz)	30 MHz ~1 GHz	---	P
		1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
		7 GHz ~ 18 GHz	---	P
		18 GHz ~ 26.5 GHz	---	P
		26.5 GHz ~ 40 GHz	---	P
	46(5230MHz)	1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
		7 GHz ~ 18 GHz	---	P
		18 GHz ~ 26.5 GHz	---	P
		26.5 GHz ~ 40 GHz	---	P

802.11ac-HT20 mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11ac - HT20	36(5180MHz)	1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
		7 GHz ~ 18 GHz	---	P
	40(5200MHz)	30 MHz ~1 GHz	---	P
		1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
		7 GHz ~ 18 GHz	---	P
		18 GHz ~ 26.5 GHz	---	P
		26.5 GHz ~ 40 GHz	---	P
	48(5240MHz)	1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P

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		7 GHz ~ 18 GHz	---	P

802.11ac-HT40 mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11ac HT40	38(5190MHz)	30 MHz ~1 GHz	---	P
		1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
		7 GHz ~ 18 GHz	---	P
		18 GHz ~ 26.5 GHz	---	P
		26.5 GHz ~ 40 GHz	---	P
	46(5230MHz)	1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
		7 GHz ~ 18 GHz	---	P
		18 GHz ~ 26.5 GHz	---	P
		26.5 GHz ~ 40 GHz	---	P

802.11ac-HT80 mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11ac – HT80	42(5210MHz)	1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
		7 GHz ~ 18 GHz	---	P
		18 GHz ~ 26.5 GHz	---	P
		26.5 GHz ~ 40 GHz	---	P

Conclusion: PASS

Note:

A "reference path loss" is established and the A_{Rpl} is the attenuation of “reference path loss”, and including the gain of receive antenna, the gain of the preamplifier, the cable loss.

P_{Mea} is the field strength recorded from the instrument.

The measurement results are obtained as described below:

Result=P_{Mea}+$A_{Rpl=}$ P_{Mea}+Cable Loss+Antenna Factor

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AVERAGE Results:

802.11a

Channel 36

Frequency (MHz)	Measurement Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Limit (dBμV/m)	Margin (dB)	Antenna Pol. (H/V)
5149.000	48.5	-23.3	34.3	37.48	54.0	5.5	H
5150.000	49.2	-23.3	34.3	38.20	54.0	4.8	H
10861.000	32.9	-30.3	37.9	25.30	54.0	21.1	H
15540.400	36.0	-25.0	40.1	20.86	54.0	18.0	H
17750.300	38.8	-22.4	41.5	19.70	54.0	15.2	H
17910.900	39.0	-22.4	41.5	19.88	54.0	15.0	H

Channel 40

Frequency (MHz)	Measurement Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Limit (dBμV/m)	Margin (dB)	Antenna Pol. (H/V)
5150.000	40.8	-23.3	34.3	29.82	54.0	13.2	H
5355.000	39.3	-22.3	34.3	27.27	54.0	14.7	H
10883.000	32.9	-30.3	38.0	25.29	54.0	21.1	H
15599.800	36.0	-25.0	40.2	20.78	54.0	18.0	H
17748.100	38.9	-22.4	41.6	19.81	54.0	15.1	H
17919.700	38.9	-22.3	41.5	19.78	54.0	15.1	H

Channel 48

Frequency (MHz)	Measurement Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Limit (dBμV/m)	Margin (dB)	Antenna Pol. (H/V)
5352.000	39.2	-22.3	34.3	27.16	54.0	14.8	H
5358.000	39.2	-22.3	34.3	27.14	54.0	14.8	H
10982.000	32.8	-30.0	38.0	24.85	54.0	21.2	H
15719.700	35.7	-24.9	40.4	20.17	54.0	18.3	H
17824.000	38.8	-22.5	41.5	19.78	54.0	15.2	H
17901.000	39.0	-22.4	41.5	19.84	54.0	15.0	H

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802.11n-HT20

Channel 36

Frequency (MHz)	Measurement Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Limit (dBμV/m)	Margin (dB)	Antenna Pol. (H/V)
5149.000	44.4	-23.3	34.3	33.45	54.0	9.6	H
5150.000	44.9	-23.3	34.3	33.96	54.0	9.1	H
11020.000	33.3	-29.8	38.0	25.06	54.0	20.7	H
15540.400	35.9	-25.0	40.1	20.81	54.0	18.1	H
17747.000	38.9	-22.4	41.6	19.75	54.0	15.1	H
17832.800	38.9	-22.5	41.5	19.80	54.0	15.1	H

Channel 40

Frequency (MHz)	Measurement Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Limit (dBμV/m)	Margin (dB)	Antenna Pol. (H/V)
5150.000	39.3	-23.3	34.3	28.30	54.0	14.7	H
5353.000	39.3	-22.3	34.3	27.22	54.0	14.7	H
10777.400	32.3	-30.6	37.9	25.03	54.0	21.7	H
15599.800	36.0	-25.0	40.2	20.85	54.0	18.0	H
17829.500	38.9	-22.5	41.5	19.83	54.0	15.1	H
17917.500	39.1	-22.3	41.5	19.89	54.0	14.9	H

Channel 48

Frequency (MHz)	Measurement Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Limit (dBμV/m)	Margin (dB)	Antenna Pol. (H/V)
5353.000	39.3	-22.3	34.3	27.25	54.0	14.7	H
5354.000	39.3	-22.3	34.3	27.24	54.0	14.7	H
11023.800	33.2	-29.8	38.0	24.96	54.0	20.8	H
15719.700	35.6	-24.9	40.4	20.13	54.0	18.4	H
17835.000	38.8	-22.5	41.5	19.77	54.0	15.2	H
17908.700	39.1	-22.4	41.5	19.93	54.0	14.9	H

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802.11n-HT40

Channel 38

Frequency (MHz)	Measurement Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Limit (dBμV/m)	Margin (dB)	Antenna Pol. (H/V)
5148.000	48.6	-23.3	34.3	37.62	54.0	5.4	H
5150.000	49.0	-23.3	34.3	38.02	54.0	5.0	H
11813.600	34.0	-29.5	38.5	24.99	54.0	20.0	H
15570.100	36.2	-25.0	40.2	21.02	54.0	17.8	H
17742.600	38.9	-22.4	41.6	19.82	54.0	15.1	H
17932.900	39.0	-22.3	41.5	19.77	54.0	15.0	H

Channel 46

Frequency (MHz)	Measurement Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Limit (dBμV/m)	Margin (dB)	Antenna Pol. (H/V)
5350.600	39.2	-22.3	34.3	27.19	54.0	14.8	H
5354.200	39.3	-22.3	34.3	27.24	54.0	14.7	H
10872.000	32.9	-30.3	37.9	25.29	54.0	21.1	H
15690.000	36.0	-24.9	40.3	20.60	54.0	18.0	H
17776.700	38.8	-22.5	41.5	19.68	54.0	15.2	H
17919.700	39.0	-22.3	41.5	19.80	54.0	15.0	H

802.11ac-HT20

Channel 36

Frequency (MHz)	Measurement Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Limit (dBμV/m)	Margin (dB)	Antenna Pol. (H/V)
5149.600	45.0	-23.3	34.3	34.01	54.0	9.0	H
5150.000	45.1	-23.3	34.3	34.07	54.0	8.9	H
11283.400	33.2	-30.1	38.1	25.12	54.0	20.8	H
15540.400	36.0	-25.0	40.1	20.89	54.0	18.0	H
17750.300	38.8	-22.4	41.5	19.71	54.0	15.2	H
17928.500	38.9	-22.3	41.5	19.75	54.0	15.1	H

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Channel 40

Frequency (MHz)	Measurement Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Limit (dBμV/m)	Margin (dB)	Antenna Pol. (H/V)
5150.000	39.4	-23.3	34.3	28.37	54.0	14.6	H
5356.000	39.3	-22.3	34.3	27.20	54.0	14.7	H
11015.000	33.0	-29.8	38.0	24.81	54.0	21.0	H
15599.800	35.9	-25.0	40.2	20.75	54.0	18.1	H
17831.700	38.9	-22.5	41.5	19.87	54.0	15.1	H
17945.000	38.8	-22.3	41.5	19.64	54.0	15.2	H

Channel 48

Frequency (MHz)	Measurement Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Limit (dBμV/m)	Margin (dB)	Antenna Pol. (H/V)
5350.400	39.2	-22.3	34.3	27.18	54.0	14.8	H
5353.200	39.3	-22.3	34.3	27.21	54.0	14.7	H
11780.600	33.8	-29.6	38.5	24.89	54.0	20.2	H
15719.700	35.7	-24.9	40.4	20.23	54.0	18.3	H
17818.500	38.8	-22.5	41.5	19.72	54.0	15.2	H
17907.600	38.9	-22.4	41.5	19.78	54.0	15.1	H

802.11ac-HT40

Channel 38

Frequency (MHz)	Measurement Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Limit (dBμV/m)	Margin (dB)	Antenna Pol. (H/V)
5148.000	48.5	-23.3	34.3	37.56	54.0	5.5	H
5150.000	49.1	-23.3	34.3	38.09	54.0	4.9	H
11027.100	33.1	-29.8	38.0	24.82	54.0	20.9	H
15570.100	36.1	-25.0	40.2	20.96	54.0	17.9	H
17829.500	39.0	-22.5	41.5	19.88	54.0	15.0	H
17920.800	38.9	-22.3	41.5	19.77	54.0	15.1	H

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Channel 46

Frequency (MHz)	Measurement Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Limit (dBμV/m)	Margin (dB)	Antenna Pol. (H/V)
5350.200	39.2	-22.3	34.3	27.19	54.0	14.8	H
5353.400	39.4	-22.3	34.3	27.32	54.0	14.6	H
11286.700	33.2	-30.1	38.1	25.11	54.0	20.8	H
15690.000	36.0	-24.9	40.3	20.62	54.0	18.0	H
17830.600	39.0	-22.5	41.5	19.89	54.0	15.0	H
17954.900	38.8	-22.3	41.5	19.61	54.0	15.2	H

802.11ac-HT80

Channel 42

Frequency (MHz)	Measurement Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Limit (dBμV/m)	Margin (dB)	Antenna Pol. (H/V)
5145.200	48.7	-23.3	34.3	37.62	54.0	5.3	H
5150.000	49.3	-23.3	34.3	38.21	54.0	4.7	H
10620.100	32.8	-30.6	37.7	25.75	54.0	21.2	H
15629.500	36.1	-25.0	40.4	20.77	54.0	17.9	H
17785.500	38.8	-22.5	41.3	20.01	54.0	15.2	H
17913.100	38.7	-22.4	41.3	19.76	54.0	15.3	H

PEAK Results:

802.11a

Channel 36

Frequency (MHz)	Measurement Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Limit (dBμV/m)	Margin (dB)	Antenna Pol. (H/V)
5137.953	61.6	-23.3	34.3	50.61	74.0	12.4	H
5148.680	63.2	-23.3	34.3	52.22	74.0	10.8	H
10359.950	48.0	-30.3	37.6	40.75	68.3	20.3	V
15539.850	52.1	-25.0	40.1	37.00	74.0	21.9	V
17238.250	58.1	-23.1	41.9	39.36	68.3	10.2	V
17580.900	58.3	-22.6	41.6	39.32	68.3	10.0	V

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Channel 40

Frequency (MHz)	Measurement Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Limit (dBμV/m)	Margin (dB)	Antenna Pol. (H/V)
5115.800	54.0	-23.4	34.2	43.09	68.3	14.3	H
5291.800	54.0	-22.7	34.3	42.36	68.3	14.3	H
10400.100	45.5	-30.2	37.7	37.92	68.3	22.9	V
15599.800	51.4	-25.0	40.2	36.22	74.0	22.6	V
16977.550	57.9	-23.3	42.2	39.00	68.3	10.4	H
17649.100	58.0	-22.4	41.6	38.76	68.3	10.3	H

Channel 48

Frequency (MHz)	Measurement Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Limit (dBμV/m)	Margin (dB)	Antenna Pol. (H/V)
5362.004	55.4	-22.3	34.3	43.38	74.0	18.6	H
5392.662	56.1	-22.3	34.4	44.07	74.0	17.9	H
10479.850	45.6	-30.5	37.8	38.37	68.3	22.7	H
15720.250	51.3	-24.9	40.4	35.83	74.0	22.7	H
16940.150	57.9	-23.2	42.1	38.98	68.3	10.4	V
17134.300	57.1	-23.4	42.0	38.46	68.3	11.2	H

802.11n-HT20

Channel 36

Frequency (MHz)	Measurement Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Limit (dBμV/m)	Margin (dB)	Antenna Pol. (H/V)
5145.915	61.1	-23.3	34.3	50.16	74.0	12.9	H
5147.245	61.7	-23.3	34.3	50.73	74.0	12.3	H
10359.950	46.7	-30.3	37.6	39.43	68.3	21.6	V
15539.850	51.5	-25.0	40.1	36.38	74.0	22.5	H
16810.900	57.0	-23.4	41.9	38.45	68.3	11.3	V
17019.900	57.4	-23.3	42.2	38.53	68.3	10.9	H

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Channel 40

Frequency (MHz)	Measurement Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Limit (dBμV/m)	Margin (dB)	Antenna Pol. (H/V)
5141.200	53.2	-23.3	34.3	42.25	68.3	15.1	H
5265.800	53.7	-23.0	34.3	42.43	68.3	14.6	H
10400.100	47.1	-30.2	37.7	39.62	68.3	21.2	V
15599.800	52.5	-25.0	40.2	37.34	74.0	21.5	H
16719.050	57.2	-23.5	41.8	38.88	68.3	11.1	V
17105.700	57.3	-23.4	42.1	38.67	68.3	11.0	H

Channel 48

Frequency (MHz)	Measurement Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Limit (dBμV/m)	Margin (dB)	Antenna Pol. (H/V)
5363.435	55.5	-22.3	34.3	43.47	74.0	18.5	H
5382.497	55.4	-22.3	34.4	43.34	74.0	18.6	H
10479.850	45.6	-30.5	37.8	38.38	68.3	22.7	H
15720.250	51.4	-24.9	40.4	35.87	74.0	22.6	H
16815.300	58.0	-23.4	41.9	39.43	68.3	10.3	H
17044.100	56.9	-23.3	42.1	38.11	68.3	11.4	H

802.11n-HT40

Channel 38

Frequency (MHz)	Measurement Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Limit (dBμV/m)	Margin (dB)	Antenna Pol. (H/V)
5147.438	61.8	-23.3	34.3	50.79	74.0	12.2	H
5148.523	63.5	-23.3	34.3	52.53	74.0	10.5	V
10379.750	46.1	-30.3	37.7	38.67	68.3	22.2	V
15570.100	52.1	-25.0	40.2	36.91	74.0	21.9	V
16936.300	57.1	-23.2	42.1	38.22	68.3	11.2	V
17193.150	57.2	-23.2	42.0	38.50	68.3	11.1	V

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Channel 46

Frequency (MHz)	Measurement Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Limit (dBμV/m)	Margin (dB)	Antenna Pol. (H/V)
5350.488	56.7	-22.3	34.3	44.63	74.0	17.3	H
5380.607	57.3	-22.3	34.4	45.22	74.0	16.7	H
10460.050	45.4	-30.4	37.8	38.08	68.3	22.9	V
15690.000	52.9	-24.9	40.3	37.50	74.0	21.1	V
16984.150	56.6	-23.3	42.2	37.65	68.3	11.7	V
17189.850	57.4	-23.3	42.0	38.68	68.3	10.9	H

802.11ac-HT20

Channel 36

Frequency (MHz)	Measurement Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Limit (dBμV/m)	Margin (dB)	Antenna Pol. (H/V)
5146.265	60.6	-23.3	34.3	49.59	74.0	13.4	H
5148.680	61.5	-23.3	34.3	50.49	74.0	12.5	H
10359.950	46.1	-30.3	37.6	38.79	68.3	22.2	H
15539.850	51.2	-25.0	40.1	36.03	74.0	22.8	H
16770.750	56.3	-23.4	41.9	37.83	68.3	12.0	H
17032.000	56.9	-23.3	42.2	38.02	68.3	11.5	H

Channel 40

Frequency (MHz)	Measurement Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Limit (dBμV/m)	Margin (dB)	Antenna Pol. (H/V)
5124.400	53.9	-23.4	34.3	42.97	68.3	14.4	H
5292.200	53.9	-22.7	34.3	42.29	68.3	14.4	H
10400.100	45.9	-30.2	37.7	38.39	68.3	22.4	H
15599.800	52.0	-25.0	40.2	36.75	74.0	22.0	H
16936.300	57.7	-23.2	42.1	38.85	68.3	10.6	H
17124.950	57.4	-23.4	42.0	38.74	68.3	10.9	H

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Channel 48

Frequency (MHz)	Measurement Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Limit (dBμV/m)	Margin (dB)	Antenna Pol. (H/V)
5384.697	56.0	-22.3	34.4	43.88	74.0	18.0	H
5411.643	55.6	-22.4	34.4	43.61	74.0	18.4	V
10479.850	45.9	-30.5	37.8	38.64	68.3	22.4	H
15720.250	51.9	-24.9	40.4	36.35	74.0	22.1	V
16825.200	57.6	-23.4	42.0	39.03	68.3	10.7	V
17028.700	57.6	-23.3	42.2	38.71	68.3	10.7	V

802.11ac-HT40

Channel 38

Frequency (MHz)	Measurement Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Limit (dBμV/m)	Margin (dB)	Antenna Pol. (H/V)
5147.438	61.8	-23.3	34.3	50.79	74.0	12.2	H
5148.523	63.5	-23.3	34.3	52.53	74.0	10.5	V
10379.750	46.1	-30.3	37.7	38.67	68.3	22.2	V
15570.100	52.1	-25.0	40.2	36.91	74.0	21.9	V
16936.300	57.1	-23.2	42.1	38.22	68.3	11.2	V
17193.150	57.2	-23.2	42.0	38.50	68.3	11.1	V

Channel 46

Frequency (MHz)	Measurement Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Limit (dBμV/m)	Margin (dB)	Antenna Pol. (H/V)
5350.488	56.7	-22.3	34.3	44.63	74.0	17.3	H
5380.607	57.3	-22.3	34.4	45.22	74.0	16.7	H
10460.050	45.4	-30.4	37.8	38.08	68.3	22.9	V
15690.000	52.9	-24.9	40.3	37.50	74.0	21.1	V
16984.150	56.6	-23.3	42.2	37.65	68.3	11.7	V
17189.850	57.4	-23.3	42.0	38.68	68.3	10.9	H

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802.11ac-HT80

Channel 42

Frequency (MHz)	Measurement Result (dBµV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBµV)	Limit (dBµV/m)	Margin (dB)	Antenna Pol. (H/V)
5145.548	62.8	-23.3	34.3	51.73	74.0	11.2	H
5147.893	63.4	-23.3	34.3	52.32	74.0	10.6	H
10419.900	46.4	-30.2	37.5	39.03	68.3	21.9	H
15630.050	51.5	-25.0	40.4	36.15	74.0	22.5	V
16927.500	57.4	-23.2	41.7	38.97	68.3	10.9	H
17311.400	57.4	-23.1	41.4	39.11	68.3	10.9	V

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B.7. AC Powerline Conducted Emission (150kHz- 30MHz)

Test Condition:

Voltage（V）	Frequency（Hz）
120	60

Measurement uncertainty:

Expanded measurement uncertainty for this test item is U =3.10dB, k=2.

Measurement Result and limit:

WLAN (Quasi-peak Limit)

Frequency range (MHz)	Quasi-peak Limit (dBmV)	Result (dBmV)		Conclusion
		With charger		
		802.11a	Idle	
0.15o 0.5	66 to 56	Fig.29	Fig.30	P
0.5 to 5	56			
5 to 30	60			
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.				

WLAN (Average Limit)

Frequency range (MHz)	Average Limit (dBmV)	Result (dBmV)		Conclusion
		With charger		
		802.11a	Idle	
0.15 to 0.5	56 to 46	Fig.29	Fig.30	P
0.5 to 5	46			
5 to 30	50			
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.				

Conclusion: PASS

Test graphs as below:

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Traffic:

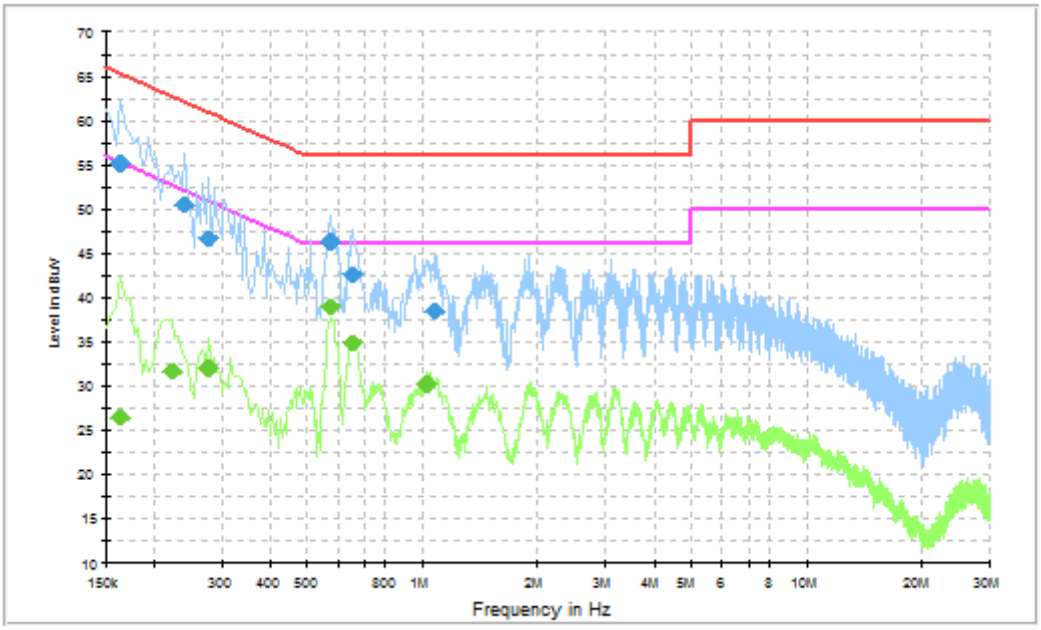

Fig. 29 Conducted Emission (802.11a, Ch40, TX)

Note1: The graphic result above is the maximum of the measurements for both phase line and neutral line.

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.163500	55.1	5000.0	9.000	N	20.0	10.2	65.3
0.240000	50.5	5000.0	9.000	N	19.9	11.6	62.1
0.276000	46.8	5000.0	9.000	N	19.9	14.2	60.9
0.577500	46.3	5000.0	9.000	L1	20.0	9.7	56.0
0.654000	42.6	5000.0	9.000	L1	19.9	13.4	56.0
1.068000	38.5	5000.0	9.000	L1	19.8	17.5	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.163500	26.4	5000.0	9.000	L1	20.0	28.8	55.3
0.222000	31.7	5000.0	9.000	N	19.9	21.0	52.7
0.276000	32.0	5000.0	9.000	N	19.9	18.9	50.9
0.577500	39.1	5000.0	9.000	N	20.0	6.9	46.0
0.654000	34.9	5000.0	9.000	N	19.9	11.1	46.0
1.018500	30.2	5000.0	9.000	N	19.8	15.8	46.0

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Idle:

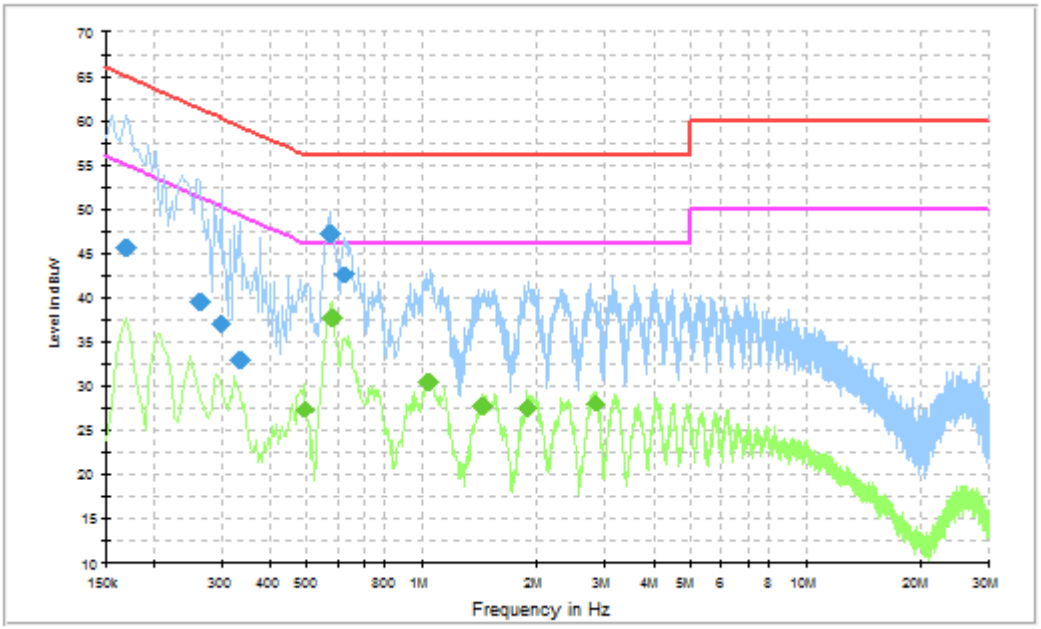

Fig. 30 Conducted Emission(802.11a, IDLE)

Note1: The graphic result above is the maximum of the measurements for both phase line and neutral line.

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.168000	45.7	5000.0	9.000	L1	20.1	19.4	65.1
0.262500	39.5	5000.0	9.000	N	19.9	21.8	61.4
0.298500	37.0	5000.0	9.000	N	19.9	23.2	60.3
0.334500	32.9	5000.0	9.000	L1	19.9	26.4	59.3
0.573000	47.2	5000.0	9.000	L1	20.0	8.8	56.0
0.627000	42.6	5000.0	9.000	L1	19.9	13.4	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.492000	27.5	5000.0	9.000	N	20.0	18.7	46.1
0.582000	37.8	5000.0	9.000	N	20.0	8.2	46.0
1.036500	30.5	5000.0	9.000	N	19.8	15.5	46.0
1.441500	27.8	5000.0	9.000	N	19.8	18.2	46.0
1.882500	27.5	5000.0	9.000	N	19.8	18.5	46.0
2.818500	28.0	5000.0	9.000	N	19.8	18.0	46.0

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B.8. 99% Occupied bandwidth

Method of Measurement: See ANSI C63.10-2013-clause 12.4.2.

a) The instrument center frequency is set to the nominal EUT channel center frequency. The frequency span for the spectrum analyzer shall be between 1.5 times and 5.0 times the OBW.

b) The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW, and VBW shall be approximately three times the RBW, unless otherwise specified by the applicable requirement.

c) Set the reference level of the instrument as required, keeping the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope shall be more than [10 log (OBW/RBW)] below the reference level. Specific guidance is given in 4.1.5.2.

d) Step a) through step c) might require iteration to adjust within the specified range.

e) Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.

f) Use the 99% power bandwidth function of the instrument (if available) and report the measured bandwidth.

g) If the instrument does not have a 99% power bandwidth function, then the trace data points are recovered and directly summed in linear power terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% ofthe total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5% of the total is reached; that frequency is recorded as the upper frequency. The 99% power bandwidth is the difference between these two frequencies.

h) The occupied bandwidth shall be reported by providing plot(s) of the measuring instrument display; the plot axes and the scale units per division shall be clearly labeled. Tabular data may be reported in addition to the plot(s).

Measurement Uncertainty:

Measurement Uncertainty	60.80Hz

Measurement Result:

Mode	Frequency	99% Occupied bandwidth (MHz)		conclusion
802.11a	5180 MHz	Fig.31	16.53	P
	5200 MHz	Fig.32	16.53	P
	5240 MHz	Fig.33	16.53	P
802.11n HT20	5180 MHz	Fig.34	16.51	P
	5200 MHz	Fig.35	17.55	P
	5240 MHz	Fig.36	17.55	P
802.11ac HT20	5180 MHz	Fig.37	17.56	P
	5200 MHz	Fig.38	17.56	P
	5240 MHz	Fig.39	17.55	P
802.11n HT40	5190 MHz	Fig.40	35.92	P
	5230 MHz	Fig.41	35.89	P

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802.11ac HT40	5190 MHz	Fig.42	35.91	P
	5230 MHz	Fig.43	35.88	P
802.11ac HT80	5210 MHz	Fig.44	74.88	P

Conclusion: PASS

Test graphs as below:

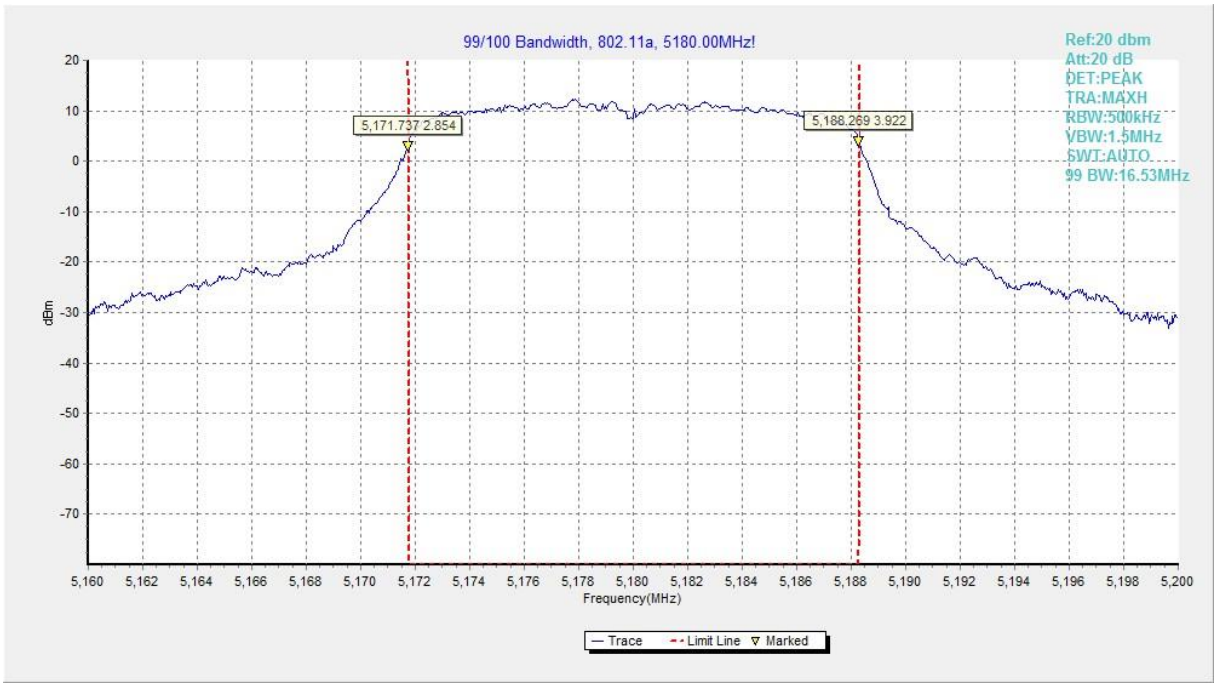

Fig.31 99% Occupied bandwidth (802.11a, 5180MHz)

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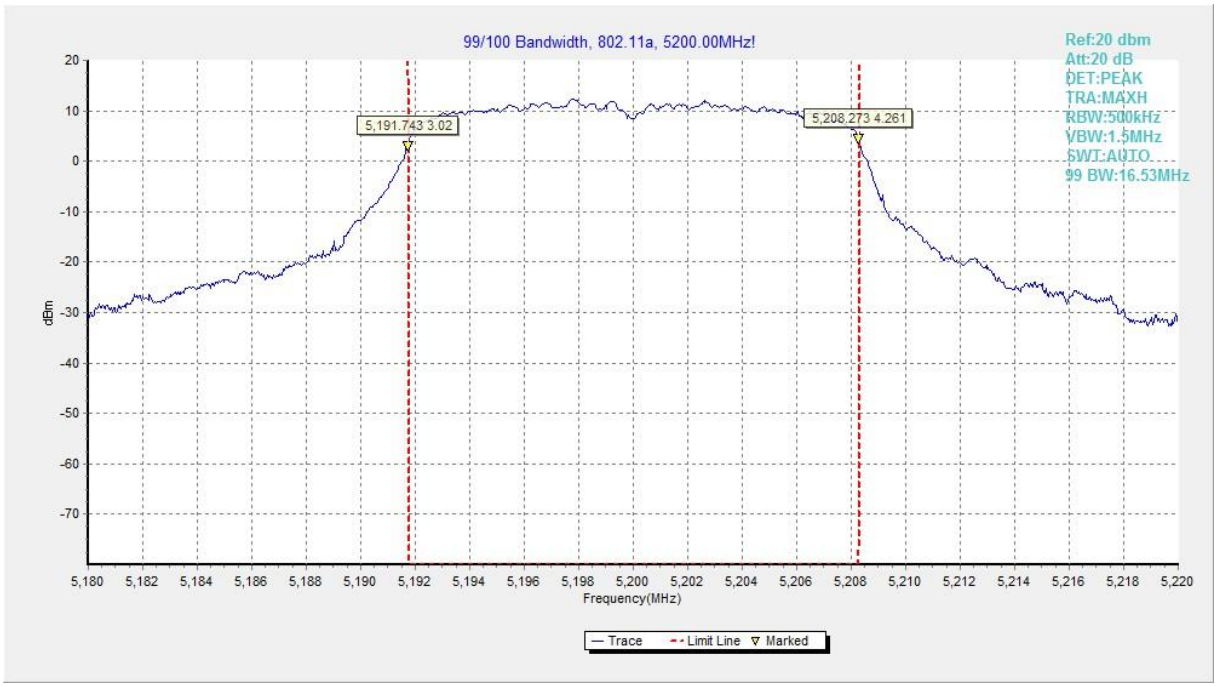

Fig.32 99% Occupied bandwidth (802.11a, 5200MHz)

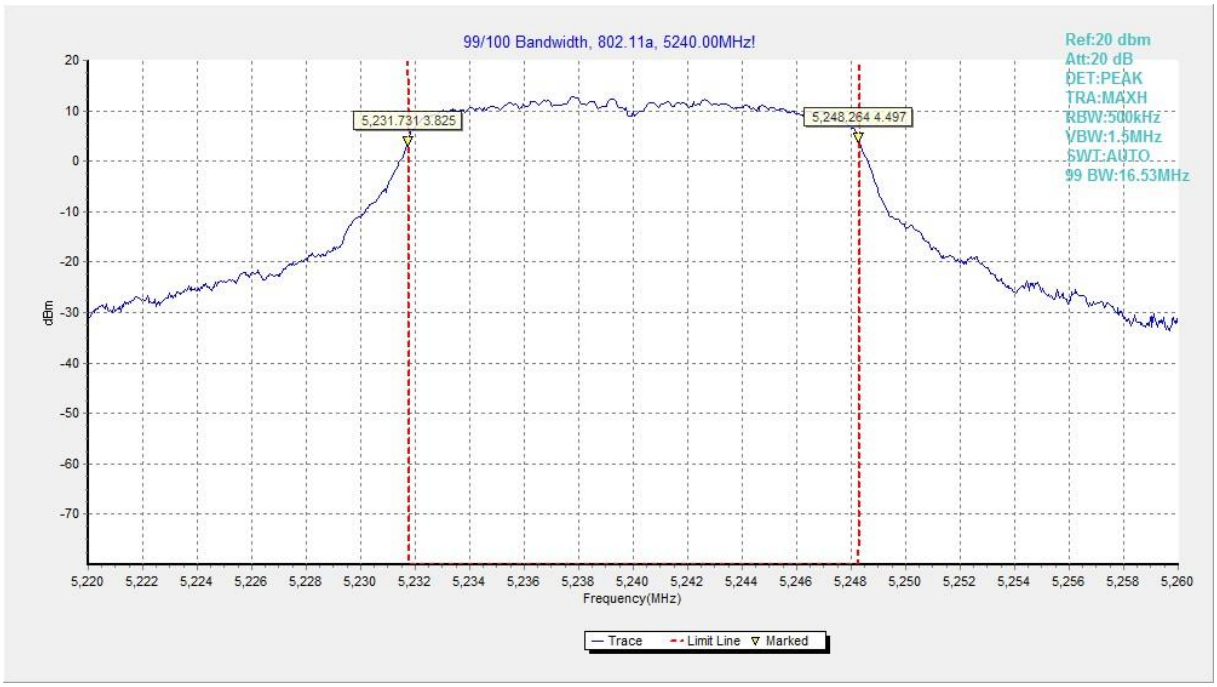

Fig.33 99% Occupied bandwidth (802.11a, 5240MHz)

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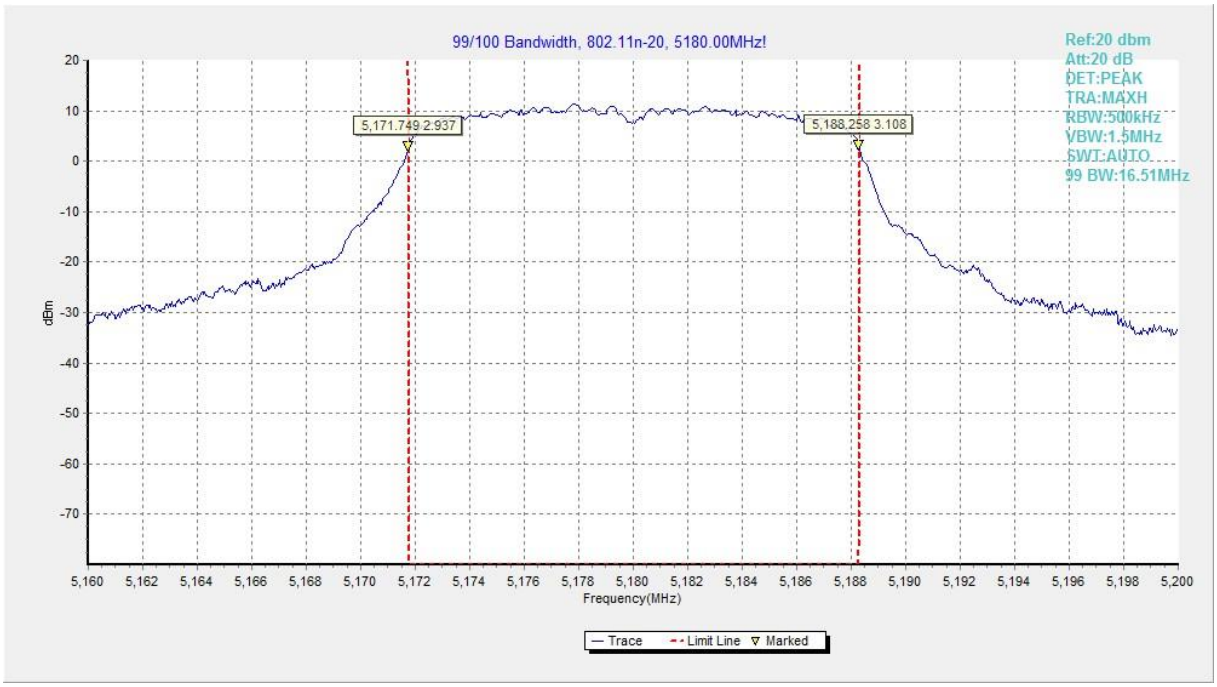

Fig.34 99% Occupied bandwidth (802.11n-HT20, 5180MHz)

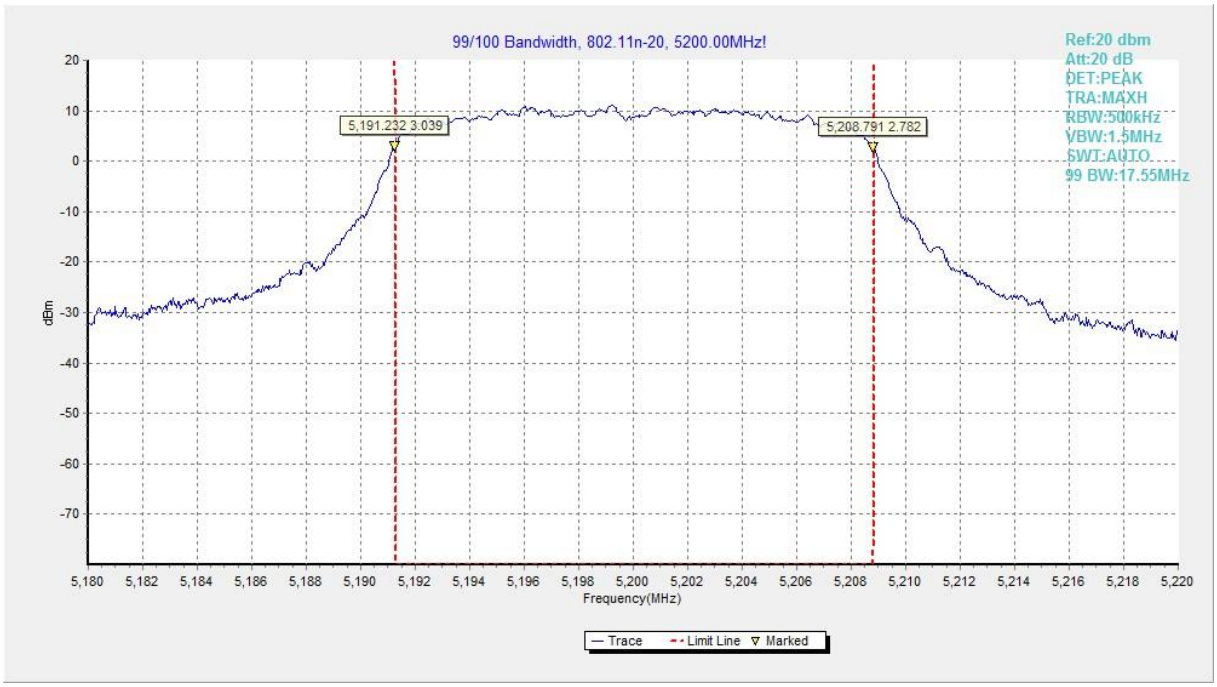

Fig.35 99% Occupied bandwidth (802.11n-HT20, 5200MHz)

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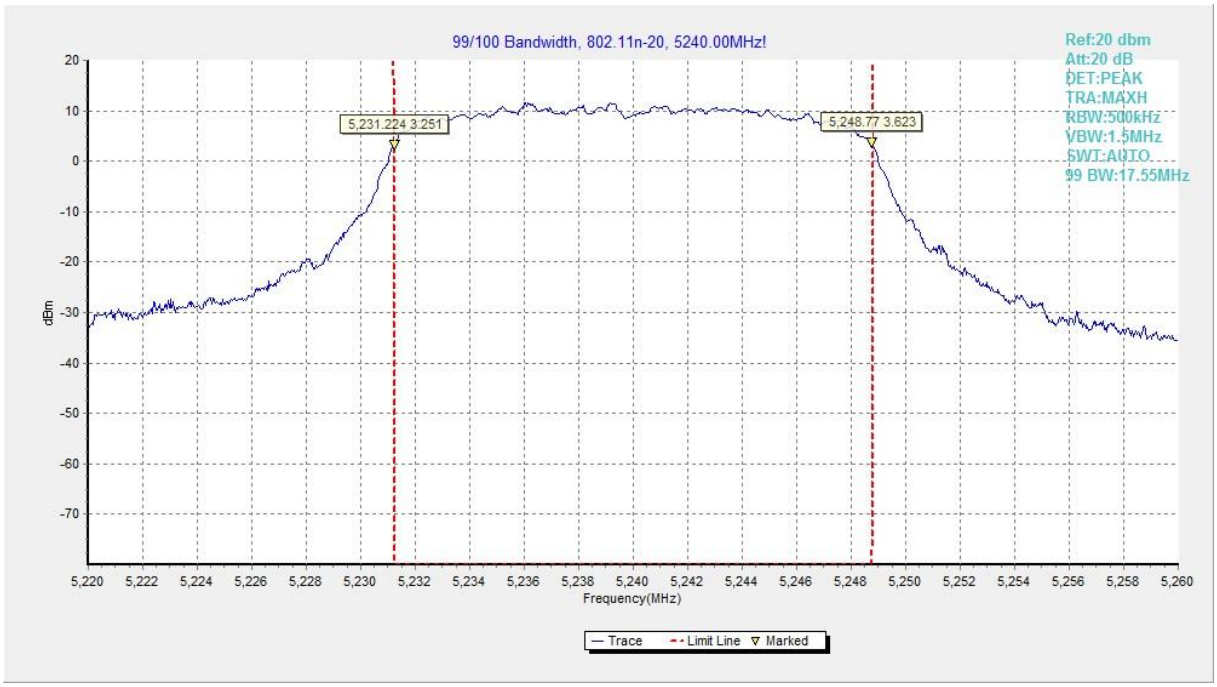

Fig.36 99% Occupied bandwidth (802.11n-HT20, 5240MHz)

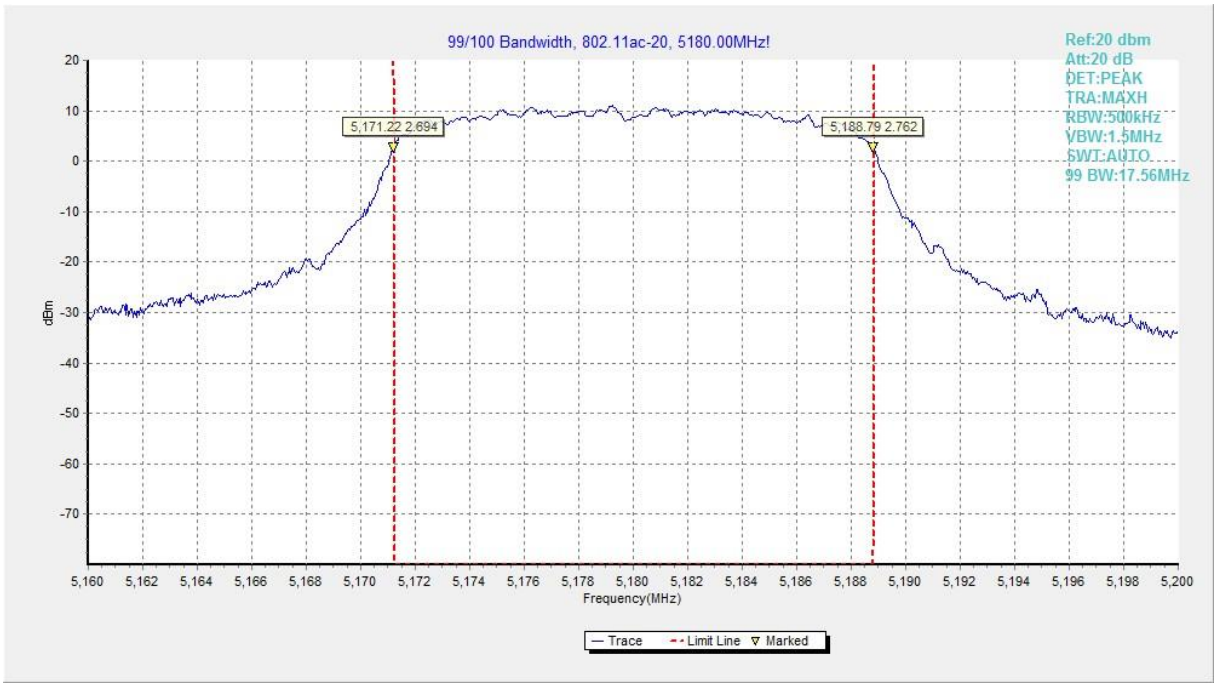

Fig.37 99% Occupied bandwidth (802.11ac-HT20, 5180MHz)

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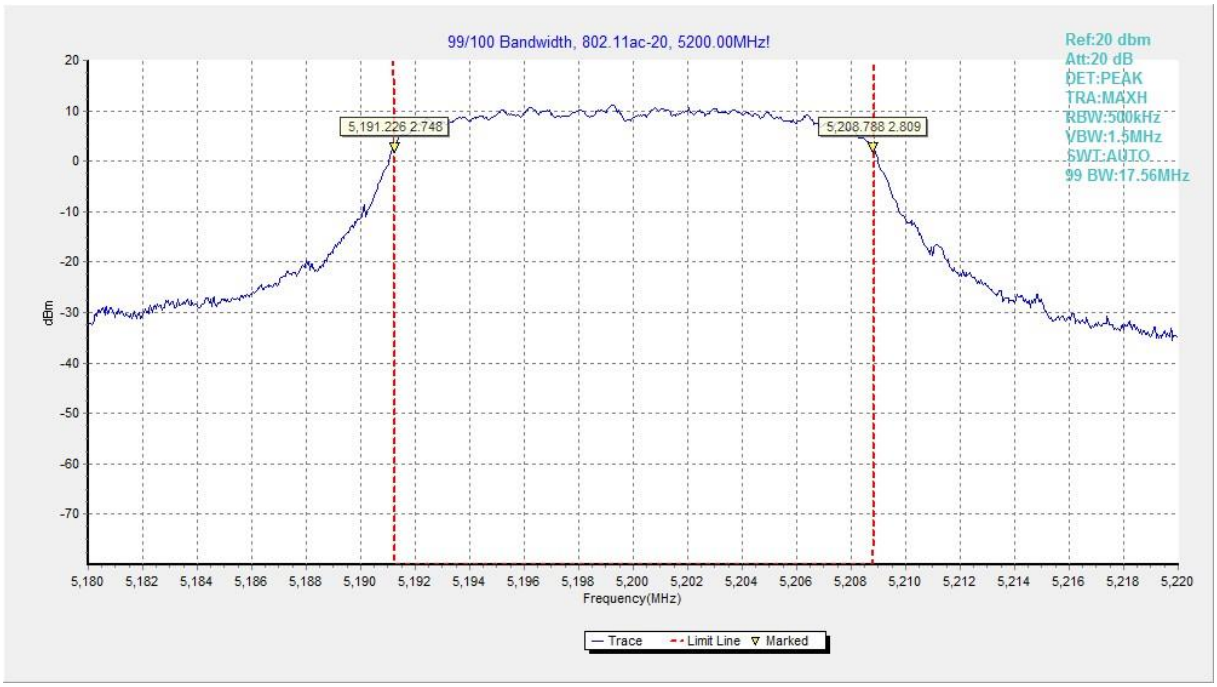

Fig.38 99% Occupied bandwidth (802.11ac-HT20, 5200MHz)

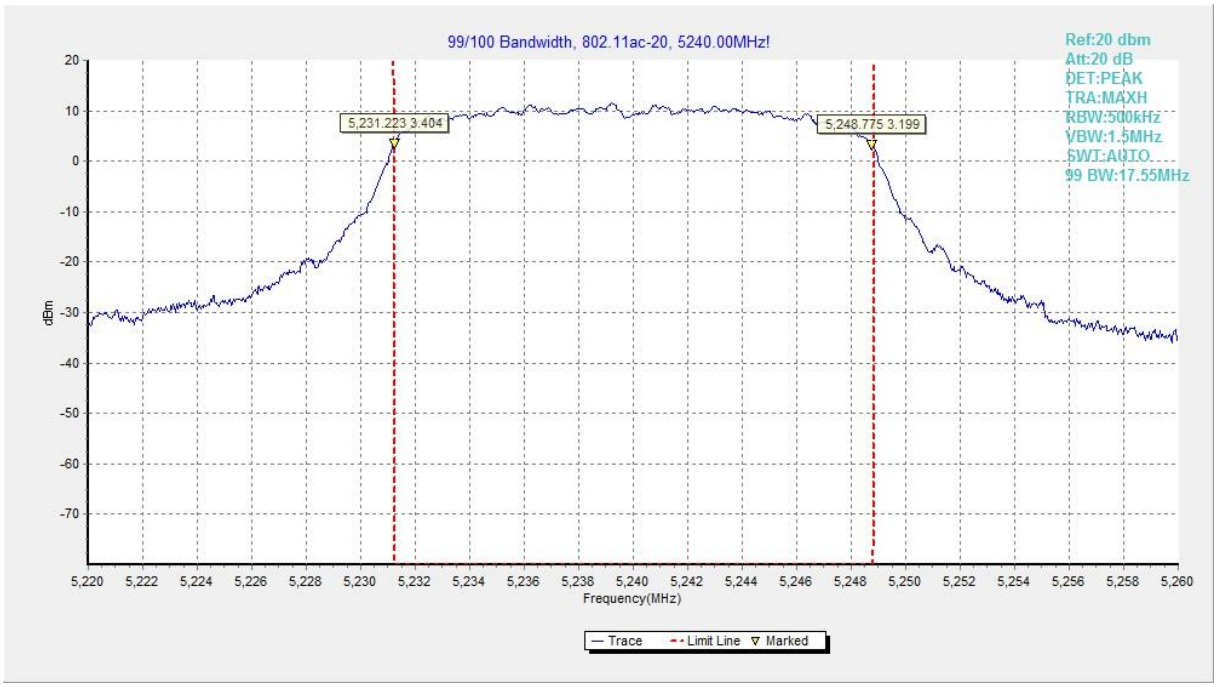

Fig.39 99% Occupied bandwidth (802.11ac-HT20, 5240MHz)

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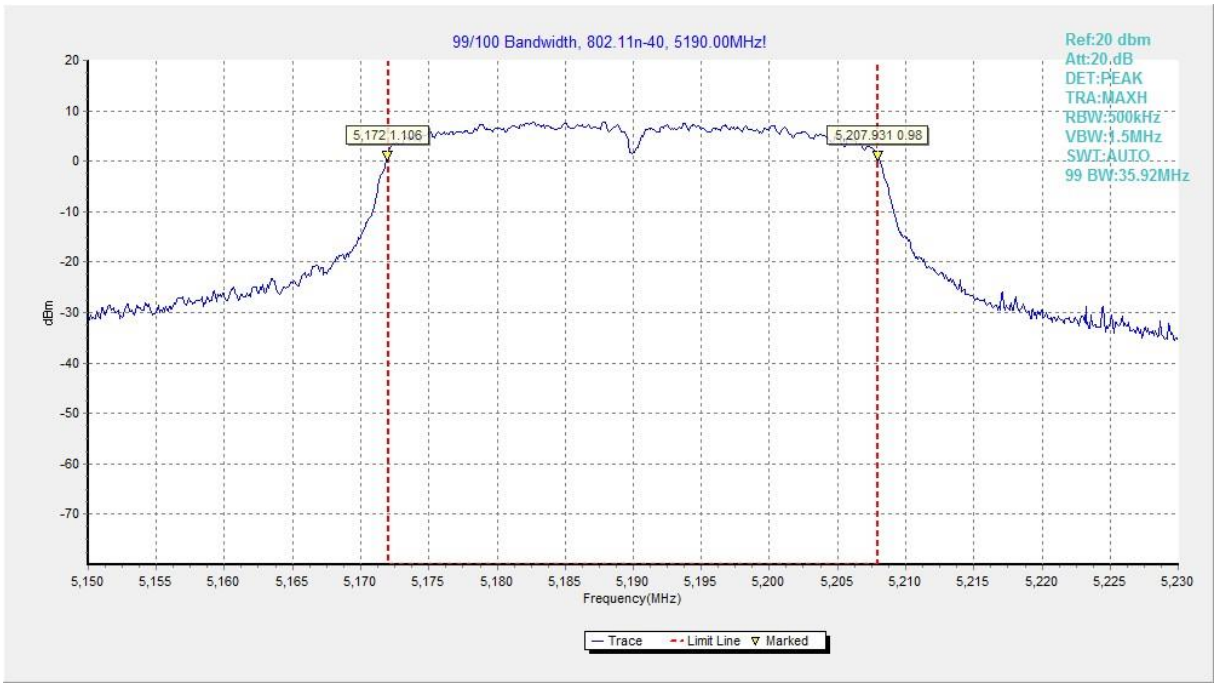

Fig.40 99% Occupied bandwidth (802.11n-HT40, 5190MHz)

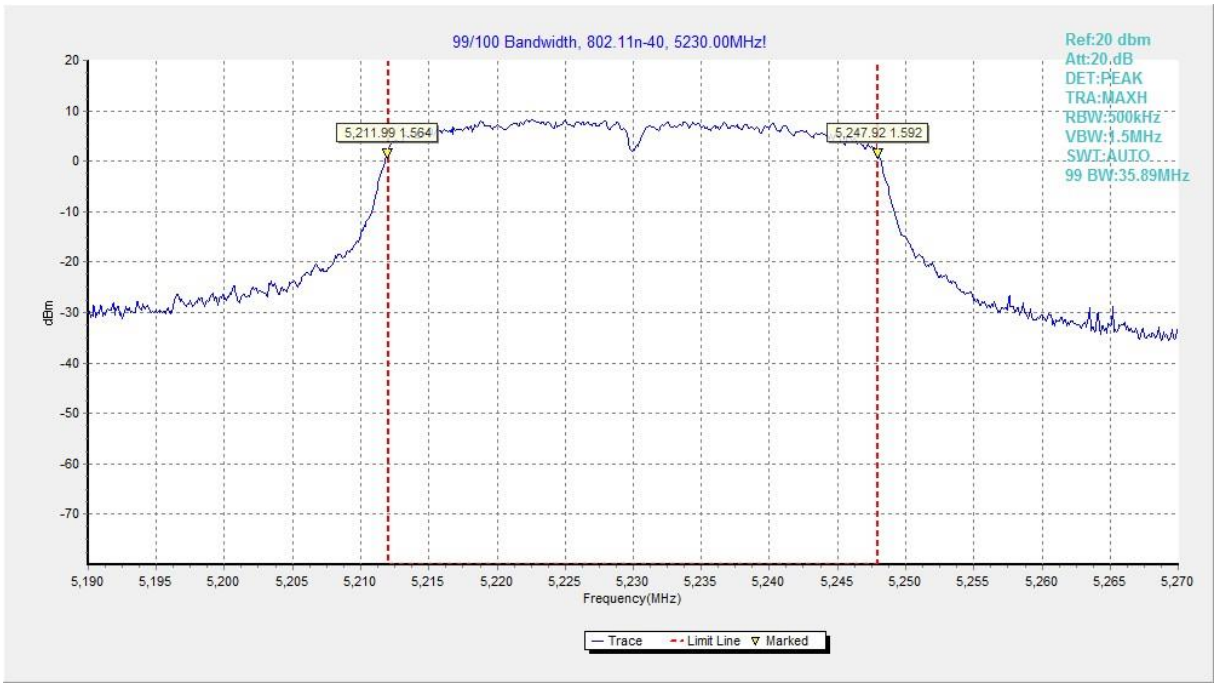

Fig.41 99% Occupied bandwidth (802.11n-HT40, 5230MHz)

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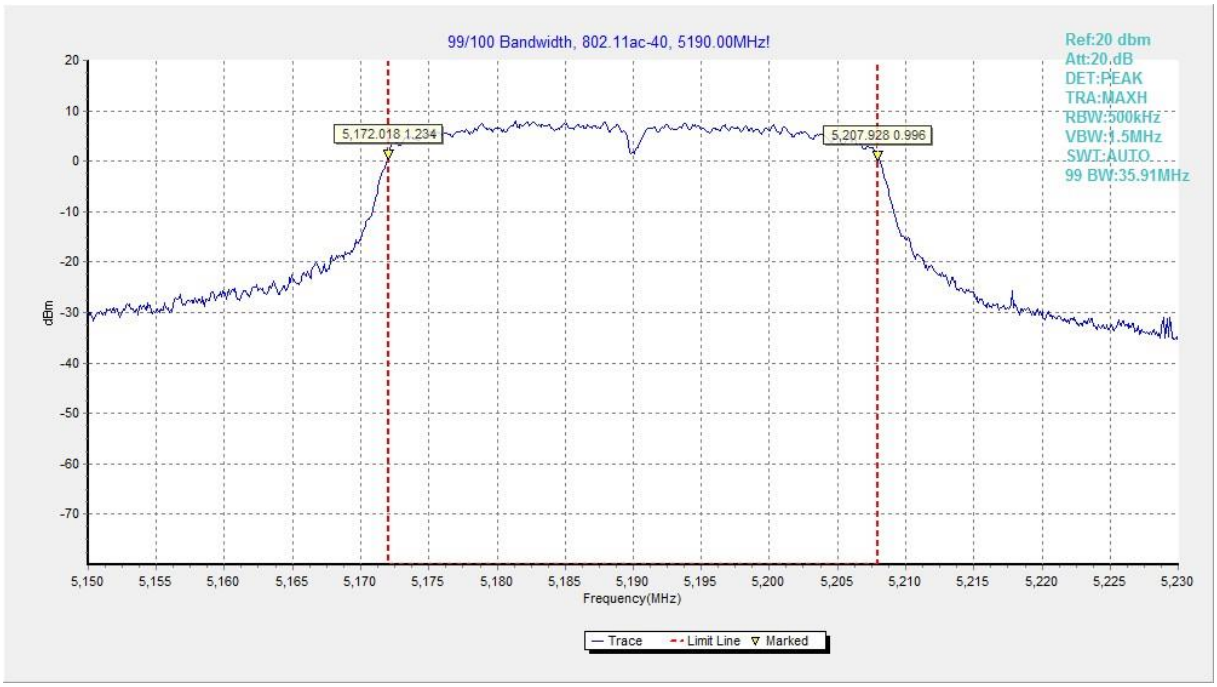

Fig.42 99% Occupied bandwidth (802.11ac-HT40, 5190MHz)

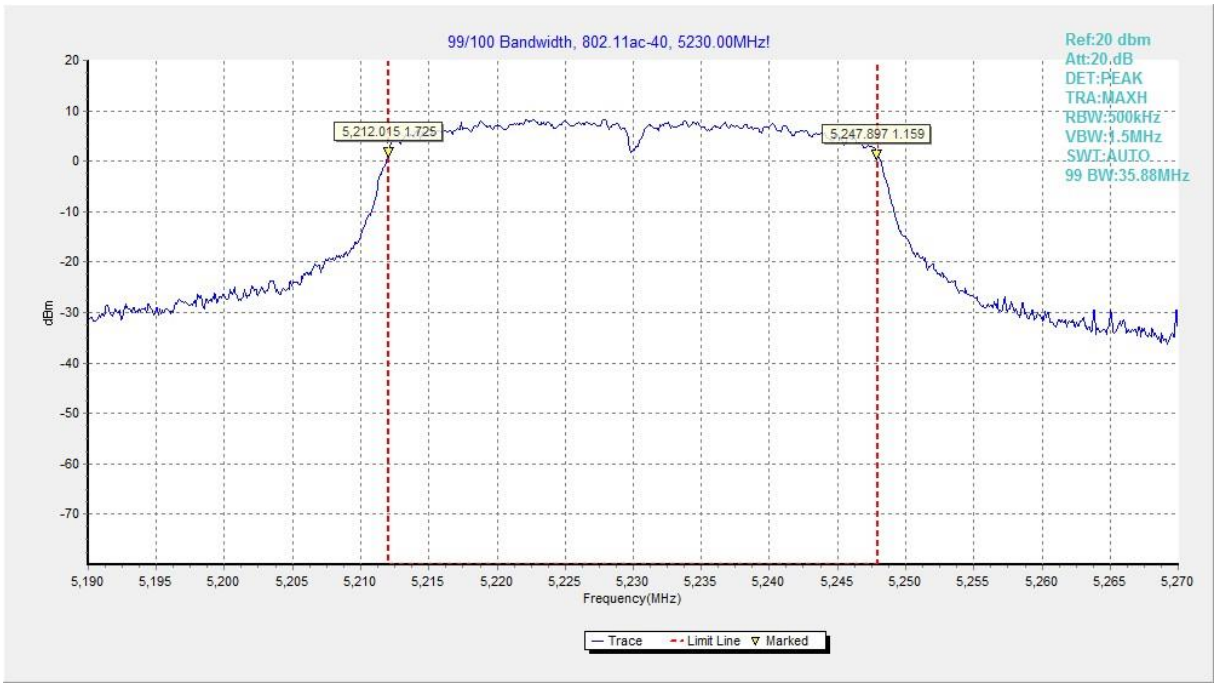

Fig.43 99% Occupied bandwidth (802.11ac-HT40, 5230MHz)

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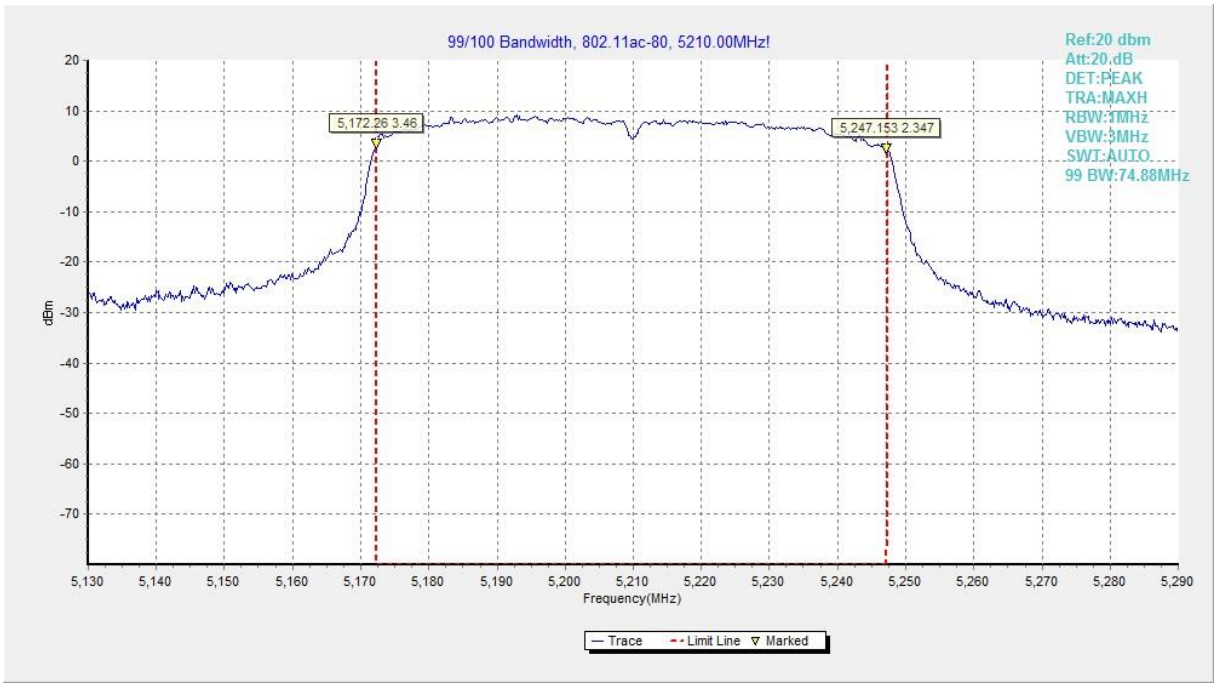

Fig.44 99% Occupied bandwidth (802.11ac-HT80, 5210MHz)

B.9. Power control

A Transmission Power Control mechanism is not required for systems with an e.i.r.p. of less than 27dBm (500 mW).

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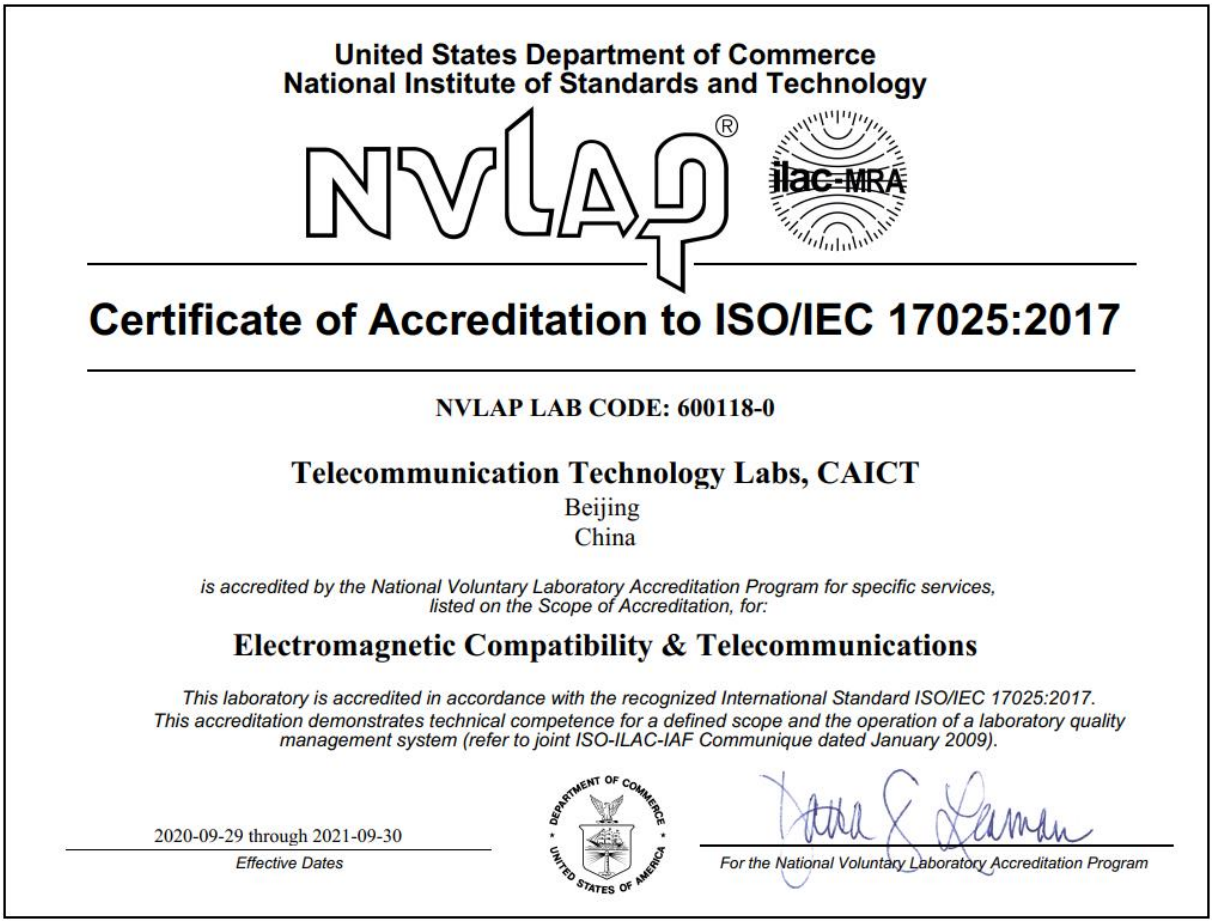
ANNEX C: Accreditation Certificate



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NVLAP LAB CODE: 600118-0

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Beijing
China

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Electromagnetic Compatibility & Telecommunications

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).

2020-09-29 through 2021-09-30
Effective Dates

DEPARTMENT OF COMMERCE * UNITED STATES OF AMERICA *

For the National Voluntary Laboratory Accreditation Program

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