



**FCC PART 15E
TEST REPORT
No. I18N00930-RLAN**

for

Yulong Computer Telecommunication Scientific (Shenzhen) Co., Ltd

Mobile Hotspot

cp331A

with

Hardware Version: P1

Software Version: 2.0.158.P0.180824.cp331A

FCC ID: R38YLCP331A

Issued Date: 2018-09-07

Designation Number: CN1210

ISED Assigned Code: 23289

Note:

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of SAICT.

Test Laboratory:

Shenzhen Academy of Information and Communications Technology

Building G, Shenzhen International Innovation Center, No.1006 Shennan Road, Futian District, Shenzhen, Guangdong, P. R. China 518026.

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REPORT HISTORY

Report Number	Revision	Description	Issue Date
I18N00930-RLAN	Rev.0	1st edition	2018-09-07

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1. TEST LATORATORY

1.1. Testing Location

Location: Shenzhen Academy of Information and Communications Technology
Address: Building G, Shenzhen International Innovation Center, No.1006
Shennan Road, Futian District, Shenzhen, Guangdong Province ,China
Postal Code: 518026
Telephone: +86(0)755-33322000
Fax: +86(0)755-33322001

1.2. Testing Environment

Normal Temperature: 15-35℃
Relative Humidity: 20-75%

1.3. Project data

Testing Start Date: 2018-08-13
Testing End Date: 2018-09-03

1.4. Signature



An Ran

(Prepared this test report)



Tang Weisheng

(Reviewed this test report)



Zhang Bojun

(Approved this test report)

2. CLIENT INFORMATION

2.1. Applicant Information

Company Name: Yulong Computer Telecommunication Scientific (Shenzhen) Co., Ltd
Address: Coolpad Information Harbor, High-tech Industrial Park (North),
Nanshan District, Shenzhen, P.R.C.
Contact Person: Chen yanting
E-Mail: Chenaynting@yulong.com
Telephone: +86 15927320221
Fax: /

2.2. Manufacturer Information

Company Name: Yulong Computer Telecommunication Scientific (Shenzhen) Co., Ltd
Address: Coolpad Information Harbor, High-tech Industrial Park (North),
Nanshan District, Shenzhen, P.R.C.
Contact Person: Chen yanting
E-Mail: Chenaynting@yulong.com
Telephone: +86 15927320221
Fax: /

3. Equipment Under Test (EUT) and Ancillary Equipment (AE)

3.1. About EUT

Description	Mobile Hotspot
Model Name	cp331A
Market Name	/
RLAN Frequency Range	ISM Bands: -5150MHz~5250MHz -5725MHz~5850MHz
RLAN Protocol	IEEE 802.11a,802.11n-HT20/40
Type of modulation	OFDM
Antenna Type	Integrated
Antenna Gain	0.5dBi
Power Supply	3.85V DC by Battery
FCC ID	R38YLCP331A
Condition of EUT as received	No abnormality in appearance

Note: Components list, please refer to documents of the manufacturer

3.2. Internal Identification of EUT

EUT ID*	IMEI	HW Version	SW Version	Receive Date
EUT1	/	P1	2.0.158.P0.180824.CP331A	2018-08-13

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

3.3. Internal Identification of AE

AE ID*	Description	Mode	Manufacturer
AE1	Switching Adapter	RD0501000-USBA-18MG	Shenzhen Ruide Electronic Industrial Co.,Ltd

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

3.4. General Description

The Equipment under Test (EUT) is a model of Tablet 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.

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.

Reference	Title	Version
FCC Part15	FCC CFR 47,Part 15,Subpart C FCC CFR 47,Part 15,Subpart E	2017
ANSI C63.10	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices	2013
KDB789033	GUIDELINES FOR COMPLIANCE TESTING OF UNLICENSED NATIONAL INFORMATION INFRASTRUCTURE (U-NII) DEVICES PART 15, SUBPART E	V02r01

5. SUMMARY OF TEST RESULTS

5.1. Summary of Test Results

No.	Test cases	Sub-clause of Part15E	Sub-clause of IC	Verdict
1	Maximum Output Power	15.407(a)	RSS-247 section 6.2	P
2	Power Spectral Density	15.407(a)	RSS-247 section 6.2	P
3	Occupied 26dB Bandwidth	15.407(a)	RSS-247 section 6.2	P
4	Occupied 6dB Bandwidth	15.407(e)	RSS-247 section 6.2.4	P
5	99% Occupied Bandwidth	15.407	RSS-247 section 6.2	P
*6	Band edge compliance	15.407	RSS-247 section 6.2	P
*7	Radiated Spurious Emissions	15.407	RSS-GEN 8.9	P
*8	AC Power line Conducted	15.207	RSS-GEN 8.8	P
9	Frequency Stability	15.407	/	P
10	Transmit Power Control	15.407	/	NA

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

“*” means radiated data refer to report No.BL-SZ1880381-602.

The radiated results are tested by Shenzhen BALUN Technology Co., Ltd. Address Block B, 1st F L, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen Guangdong Province, P.R.C. The results of radiated please see Annex B, that the partial report issued by Shenzhen BALUN Technology Co., Ltd and report No. BL-SZ1880381-602.

5.2. Statements

CTTL has evaluated the test cases requested by the applicant/manufacturer as listed in section 5.1 of this report, for the EUT specified in section 3, according to the standards or reference documents listed in section 4.2

5.3. Terms used in the result table

Terms used in Verdict column

P	Pass
NA	Not Available
F	Fail

Abbreviations

AC	Alternating Current
AFH	Adaptive Frequency Hopping
BW	Band Width
E.I.R.P.	equivalent isotropic radiated power
ISM	Industrial, Scientific and Medical
R&TTE	Radio and Telecommunications Terminal Equipment
RF	Radio Frequency
Tx	Transmitter

5.4. Laboratory Environment

Semi-anechoic Chamber did not exceed following limits along the EMC testing

Temperature	Min. = 15 °C, Max. = 30 °C
Relative humidity	Min. = 35 %, Max. = 60 %
Shielding effectiveness	0.014MHz - 1MHz, >60dB; 1MHz - 1000MHz, >90dB.
Electrical insulation	> 2 MΩ
Ground system resistance	< 4Ω
Normalised site attenuation (NSA)	< ±4dB, 3m/10m distance, from 30 to 1000 MHz
Uniformity of field strength	Between 0 and 6 dB, from 80 to 3000 MHz

Shielded room did not exceed following limits along the EMC testing

Temperature	Min. = 15 °C, Max. = 30 °C
Relative humidity	Min. = 35 %, Max. = 60 %
Shielding effectiveness	0.014MHz - 1MHz, >60dB; 1MHz - 1000MHz, >90dB.
Electrical insulation	> 2 MΩ
Ground system resistance	< 4 Ω

Fully-anechoic Chamber did not exceed following limits along the EMC testing

Temperature	Min. = 15 °C, Max. = 30 °C
Relative humidity	Min. = 35 %, Max. = 60 %
Shielding effectiveness	0.014MHz - 1MHz, >60dB; 1MHz - 1000MHz, >90dB.
Electrical insulation	> 2 MΩ
Ground system resistance	< 4Ω
Voltage Standing Wave Ratio (VSWR)	≤6dB, from 1 to 18 GHz, 3m distance

6. TEST EQUIPMENTS UTILIZED

Conducted test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Due date	Calibration Period
1	Vector Signal Analyzer	FSV40	100903	Rohde & Schwarz	2019-01-17	1 year
2	Power Sensor	U2021XA	MY55430013	Agilent	2019-02-01	1 year

Test software

No.	Equipment	Manufacturer	Version
1	TechMgr Software	CAICT	2.1.1

EUT is Qualcomm engineering software provided by the customer to control the transmitting signal.

7. Measurement Uncertainty

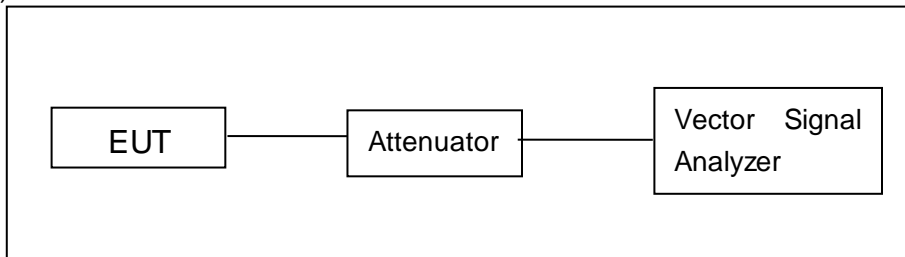
Test Name	Uncertainty	
1. RF Output Power - Conducted	±1.32dB	
2. Power Spectral Density - Conducted	±2.32dB	
3. Occupied channel bandwidth - Conducted	±66Hz	
4 Transmitter Spurious Emission - Conducted	$30\text{MHz} \leq f \leq 1\text{GHz}$	±1.41dB
	$1\text{GHz} \leq f \leq 7\text{GHz}$	±1.92dB
	$7\text{GHz} \leq f \leq 13\text{GHz}$	±2.31dB
	$13\text{GHz} \leq f \leq 26\text{GHz}$	±2.61dB

ANNEX A: MEASUREMENT RESULTS

A.1. Measurement Method

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.



A.2. Maximum output Power

Measurement Limit and Method:

Standard	Frequency (MHz)	Limit (dBm)
FCC CRF Part 15.407(a)	5150MHz~5250MHz	24
	5250MHz~5350MHz	24 or 11+10logB
	5470MHz~5725MHz	24 or 11+10logB
	5725MHz~5850MHz	30

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

Measurement of method :See ANSI C63.10-2013-Clause 12.3.3.2

Method PM-G is a measurement using a gated RF average power meter.

Measurements may be performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Because the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

Measurement Results:

U-NII Band	Mode	Channel	Frequency (MHz)	Average power (dBm)	Conclusion
5.2GHz Band (UNII-1)	802.11a	CH 36	5180	14.09	P
		CH 40	5200	14.11	P
		CH 48	5240	13.85	P
	802.11n-HT20	CH 36	5180	14.07	P
		CH 40	5200	14.03	P
		CH 48	5240	13.72	P
	802.11n-HT40	CH 38	5190	13.60	P
		CH 46	5230	13.28	P

U-NII Band	Mode	Channel	Frequency (MHz)	Average power (dBm)	Conclusion
5.8GHz Band (UNII-3)	802.11a	CH 149	5745	14.36	P
		CH 157	5785	14.49	P
		CH 165	5825	14.46	P
	802.11n-HT20	CH 149	5745	14.20	P
		CH 157	5785	14.39	P
		CH 165	5825	14.36	P
	802.11n-HT40	CH 151	5755	13.78	P
		CH 159	5795	13.97	P

Note:

Worst-case data rates as provided by the client were: 6Mbps (802.11a), MCS0 (802.11n) modes are selected as the worst-case. The following cases and test graphs are performed with this condition.

The EUT was programmed to be in continuously transmitting mode and the transmit duty cycle is not less than 98%.

A.3. Peak Power Spectral Density (conducted)

Measurement Limit:

Standard	Frequency (MHz)	Limit
FCC CRF Part 15.407(a)	5150MHz~5250MHz	11dBm/MHz
	5250MHz~5350MHz	11dBm/MHz
	5470MHz~5725MHz	11dBm/MHz
	5725MHz~5850MHz	30dBm/500KHz

The PPSD measurement method SA-1 is made according to KDB 789033.

Measurement Results:

Mode	Channel	Power Spectral Density (dBm/3KHz)	Conclusion
802.11a	5180MHz(Ch36)	7.88	P
	5200MHz(Ch40)	7.80	P
	5240MHz(Ch48)	7.90	P

Mode	Channel	Power Spectral Density (dBm/3KHz)	Conclusion
802.11n HT20	5180MHz(Ch36)	7.26	P
	5200MHz(Ch40)	7.42	P
	5240MHz(Ch48)	7.16	P

Mode	Channel	Power Spectral Density (dBm/3KHz)	Conclusion
802.11n HT40	5190MHz(Ch38)	4.84	P
	5230MHz(Ch46)	5.22	P

5.8GHz Band (UNII-3):

U-NII Band	Mode	Channel	Frequency (MHz)	Power Spectral Density (dBm/3KHz)	Conclusion
5.8GHz Band (UNII-3)	802.11a	CH 149	5745	6.46	P
		CH 157	5785	6.91	P
		CH 165	5825	6.88	P
	802.11n-HT20	CH 149	5745	6.20	P
		CH 157	5785	6.26	P
		CH 165	5825	6.43	P
	802.11n-HT40	CH 151	5755	2.77	P
		CH 159	5795	3.18	P

Conclusion: PASS

A.4. Occupied 26dB Bandwidth(conducted)

Measurement Limit:

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

The measurement is made according to KDB 789033

Measurement Result:

Mode	Channel	Occupied 26dB Bandwidth(MHz)		Conclusion
		Fig.	Value	
802.11a	5180MHz(Ch36)	Fig.1	20.95	P
	5200MHz(Ch40)	Fig.2	20.40	P
	5240MHz(Ch48)	Fig.3	20.35	P
802.11n HT20	5180MHz(Ch36)	Fig.4	21.30	P
	5200MHz(Ch40)	Fig.5	21.25	P
	5240MHz(Ch48)	Fig.6	21.15	P
802.11n HT40	5190MHz(Ch38)	Fig.7	41.04	P
	5230MHz(Ch46)	Fig.8	41.20	P

Conclusion: PASS

Test graphs as below:

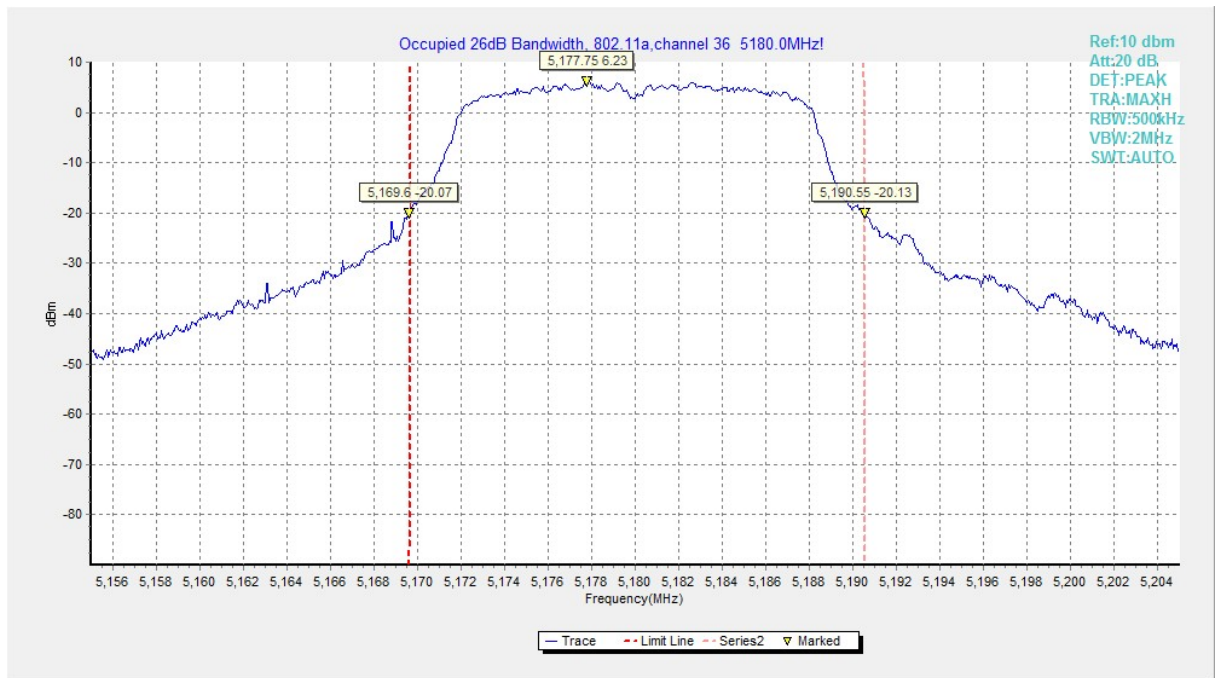


Fig. 1 Occupied 26dB Bandwidth (802.11a, 5180MHz)

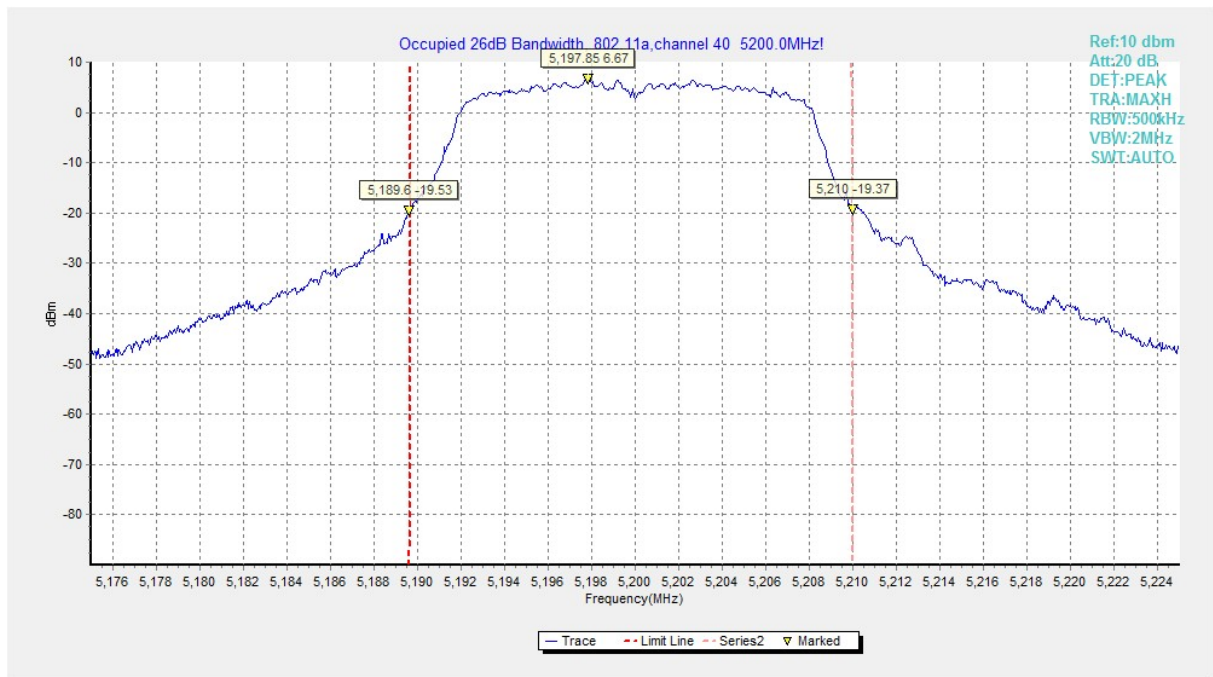


Fig. 2 Occupied 26dB Bandwidth (802.11a, 5200MHz)

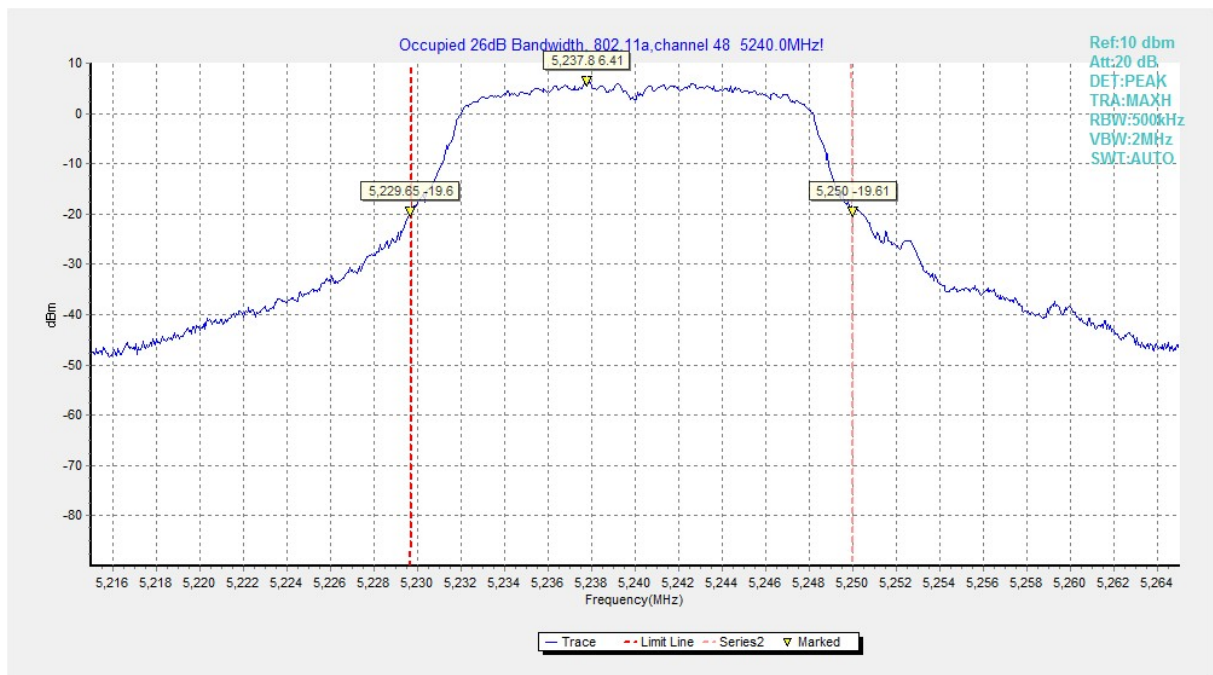


Fig. 3 Occupied 26dB Bandwidth (802.11a, 5240MHz)

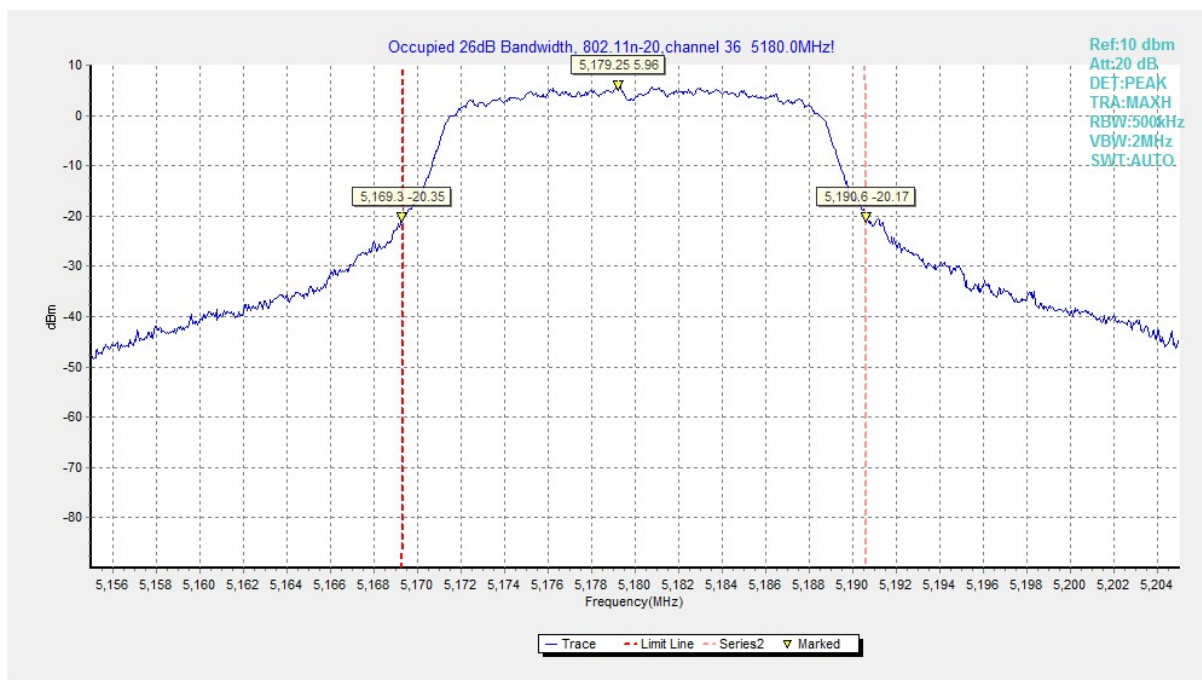


Fig. 4 Occupied 26dB Bandwidth (802.11n-HT20, 5180MHz)

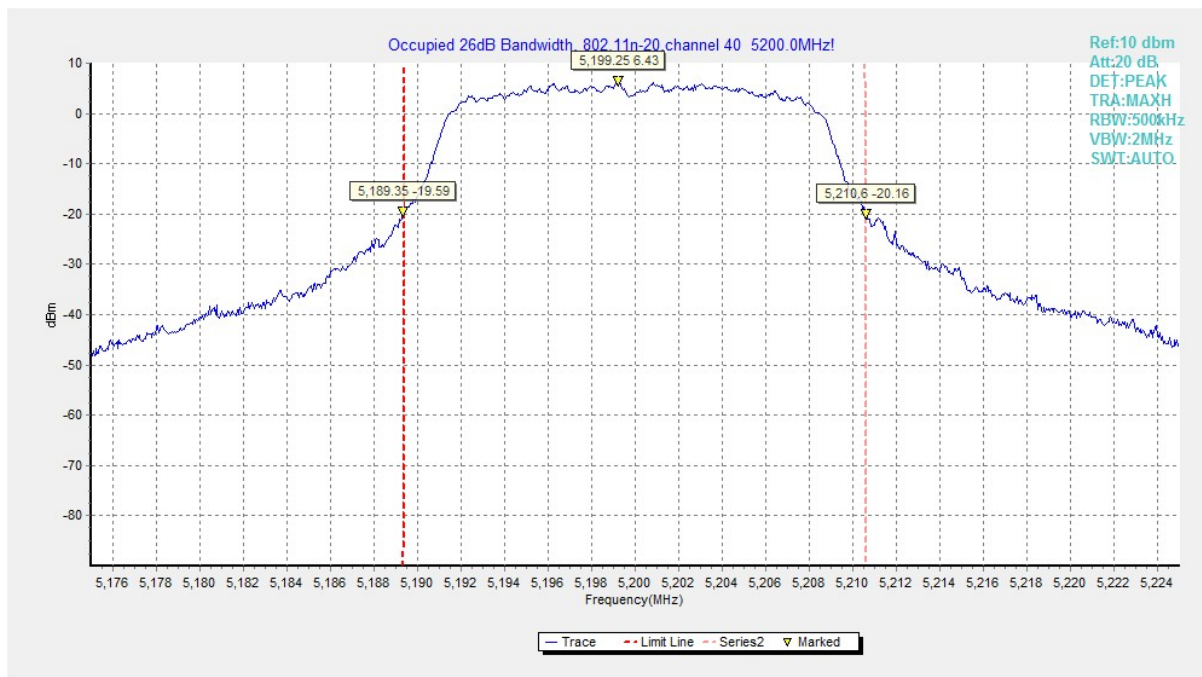


Fig. 5 Occupied 26dB Bandwidth (802.11n-HT20, 5200MHz)

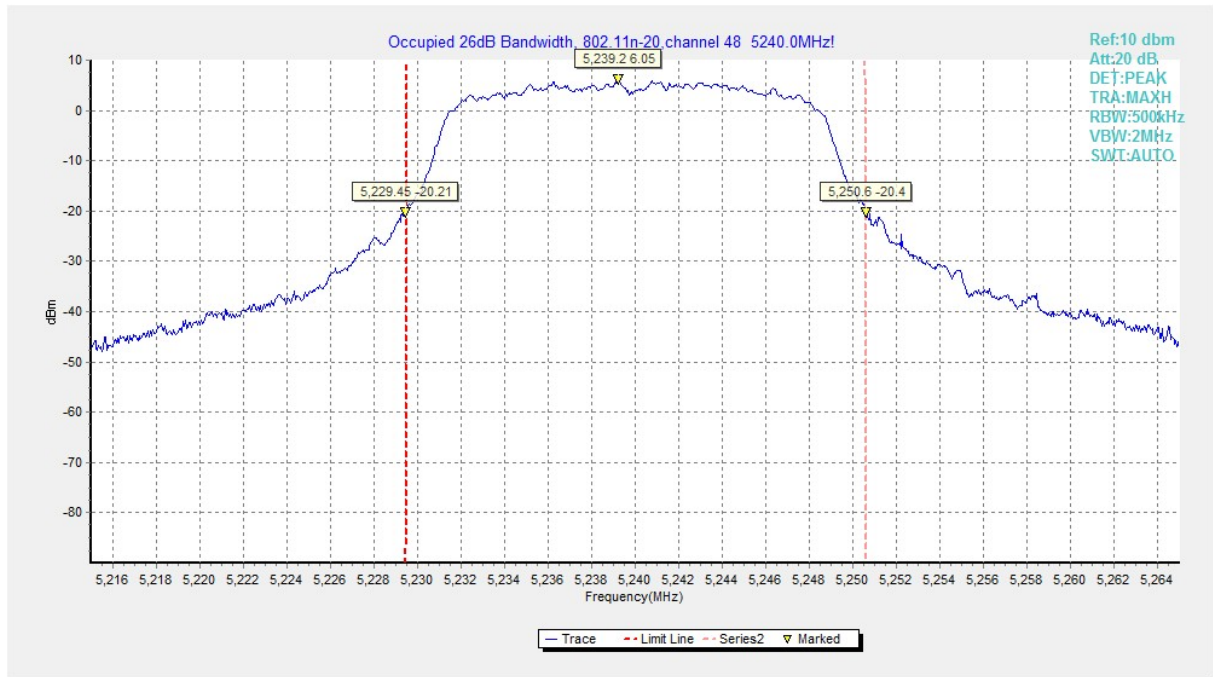


Fig. 6 Occupied 26dB Bandwidth (802.11n-HT20, 5240MHz)

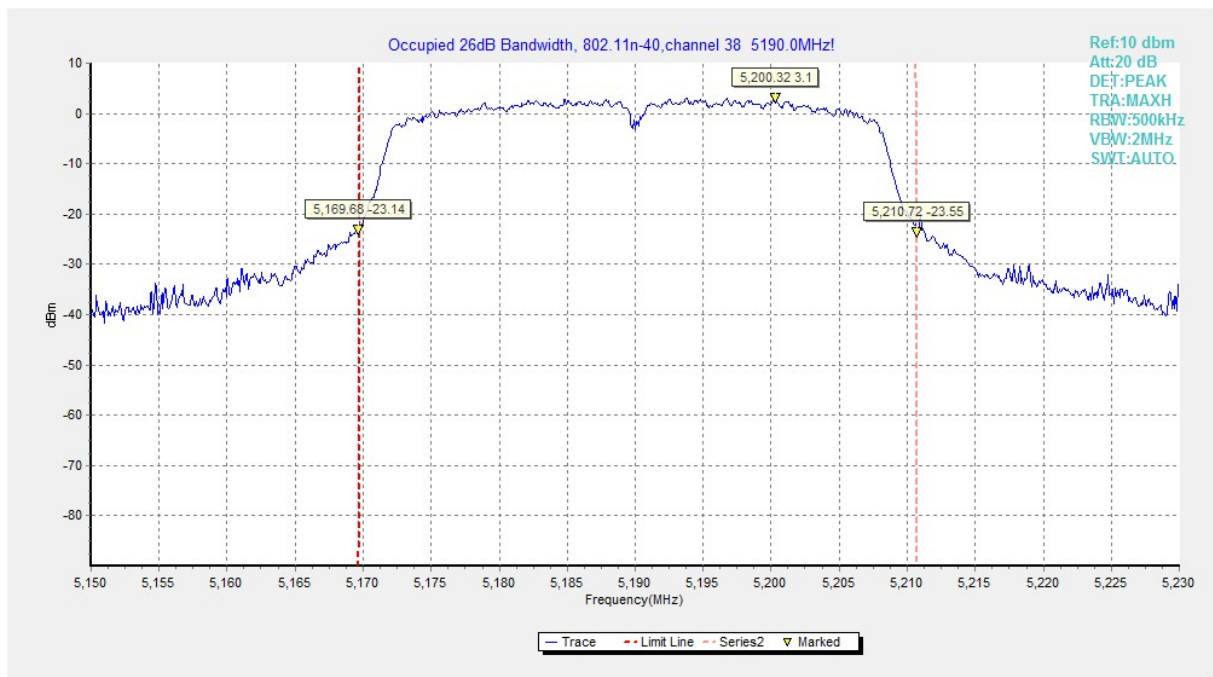


Fig. 7 Occupied 26dB Bandwidth (802.11n-HT40, 5190MHz)

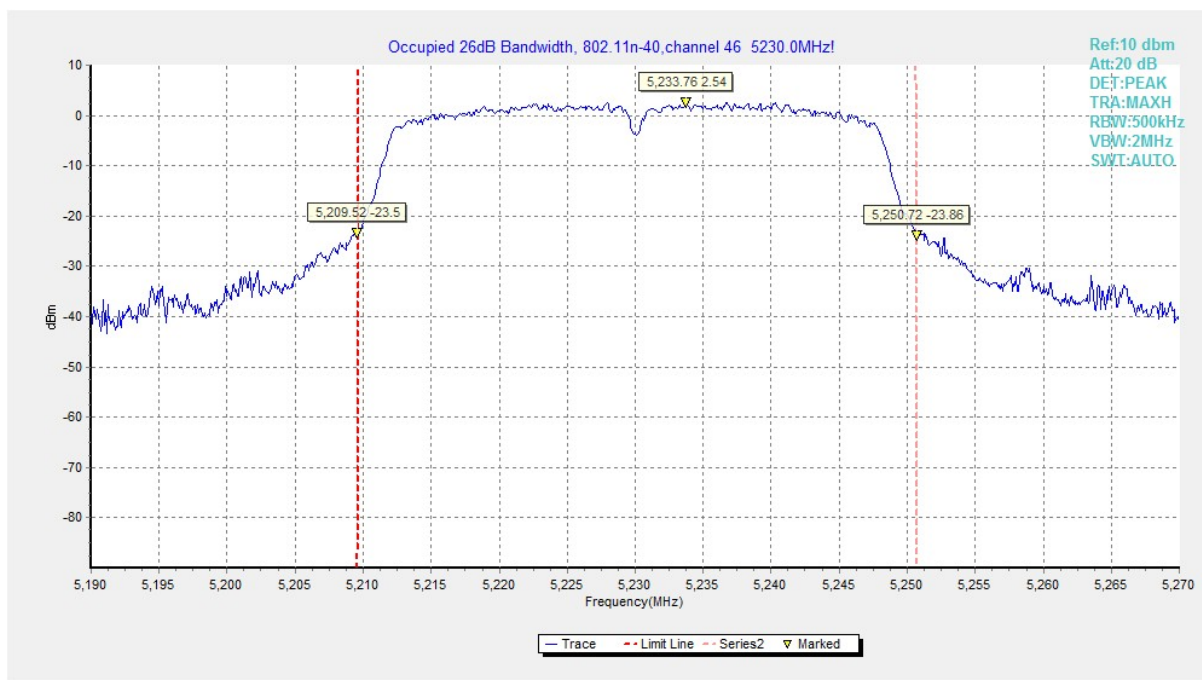


Fig. 8 Occupied 26dB Bandwidth (802.11n-HT40, 5230MHz)

A.5. Occupied 6dB Bandwidth(conducted)

Measurement Limit:

Standard	Limit (MHz)
FCC 47 CFR Part 15.407 (e)	≥0.5

The measurement is made according to KDB 789033

Measurement Result:

Mode	Channel	Occupied 6dB Bandwidth(MHz)		Conclusion
802.11a	5745MHz(Ch149)	Fig.9	16.55	P
	5785MHz(Ch157)	Fig.10	15.55	P
	5825MHz(Ch165)	Fig.11	16.55	P
802.11n HT40	5755MHz(Ch151)	Fig.12	36.64	P
	5795MHz(Ch159)	Fig.13	36.64	P

Conclusion: PASS

Test graphs as below:

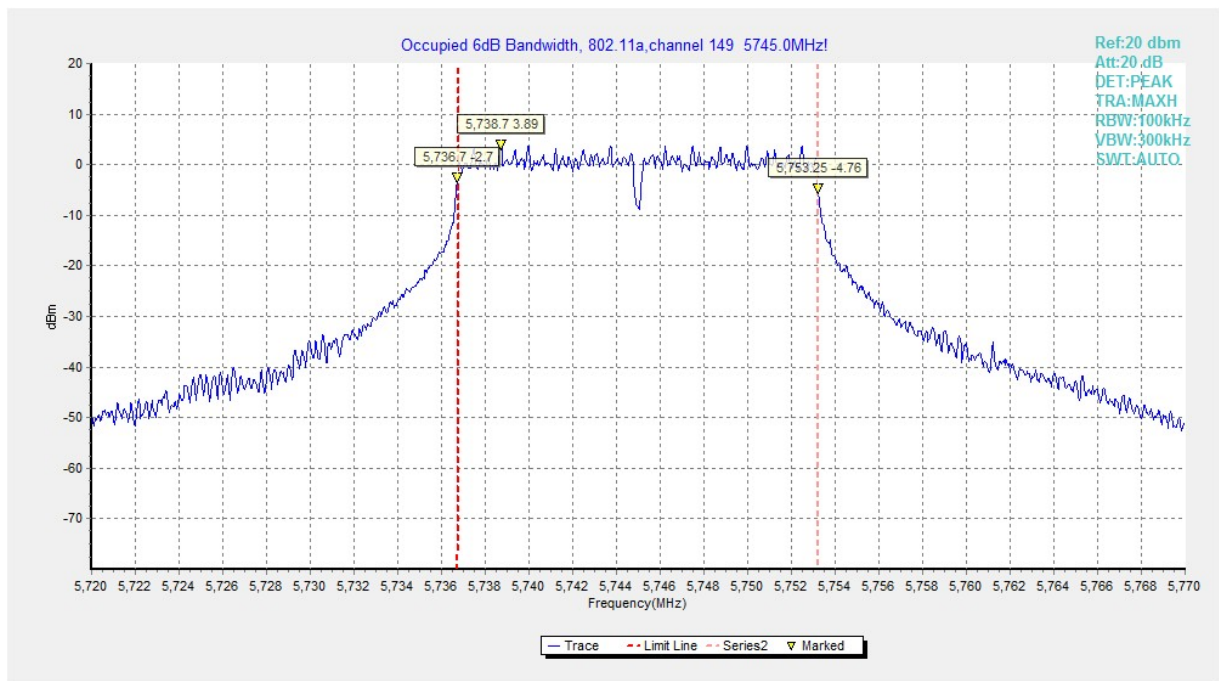


Fig. 9 Occupied 6dB Bandwidth (802.11a, 5745MHz)

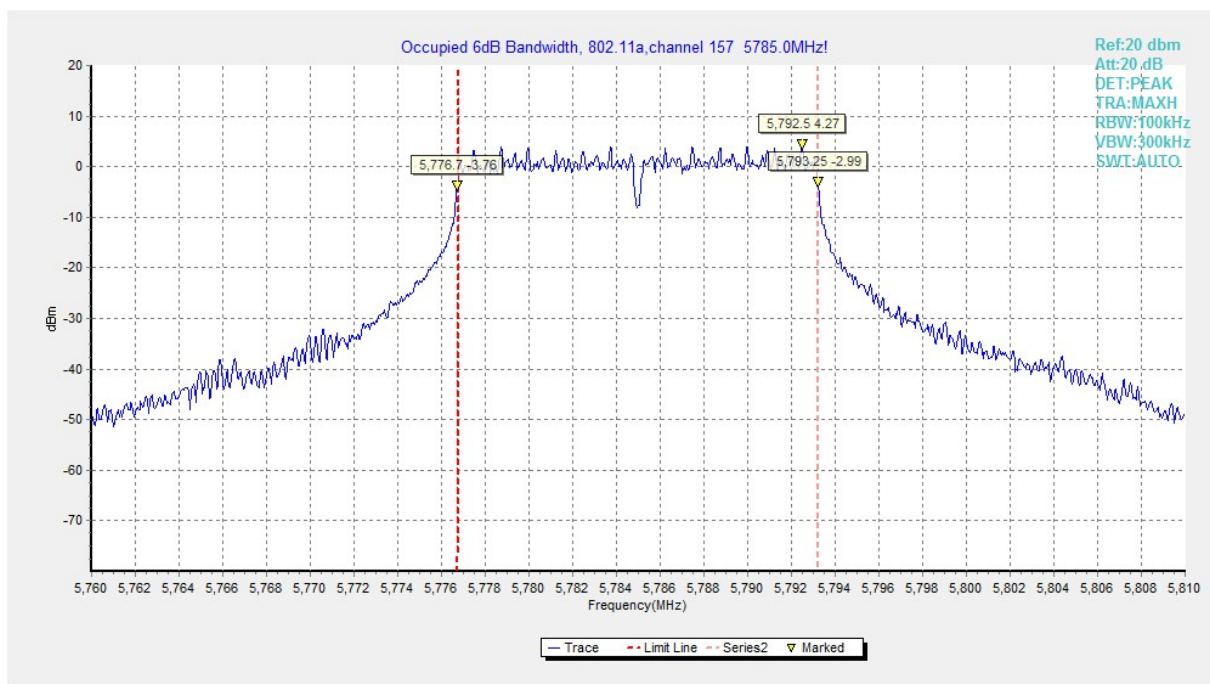


Fig. 10 Occupied 6dB Bandwidth (802.11a, 5785MHz)

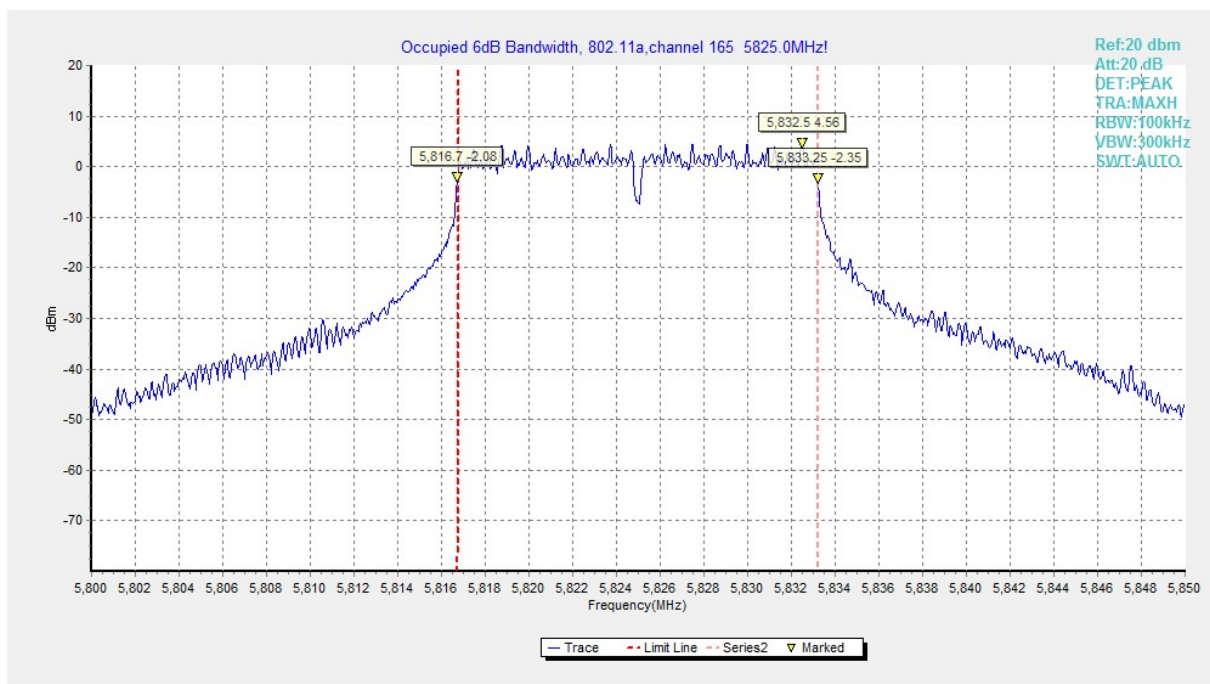


Fig. 11 Occupied 6dB Bandwidth (802.11a, 5825MHz)

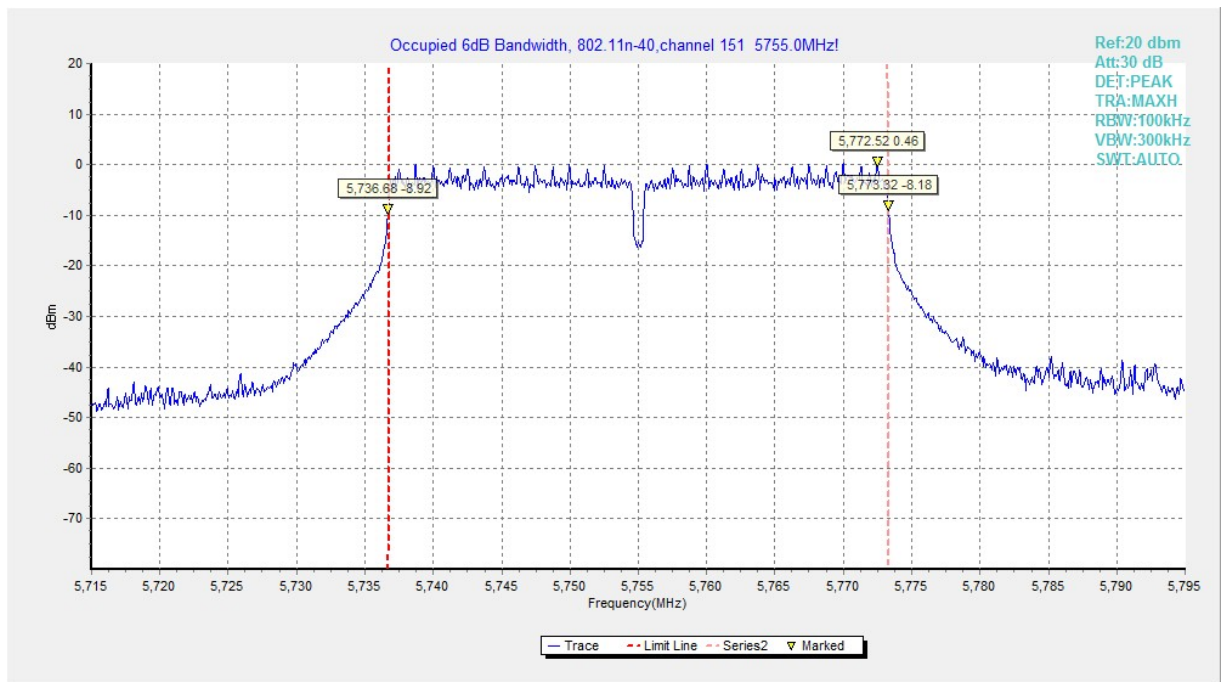


Fig. 12 Occupied 6dB Bandwidth (802.11n-HT40, 5755MHz)

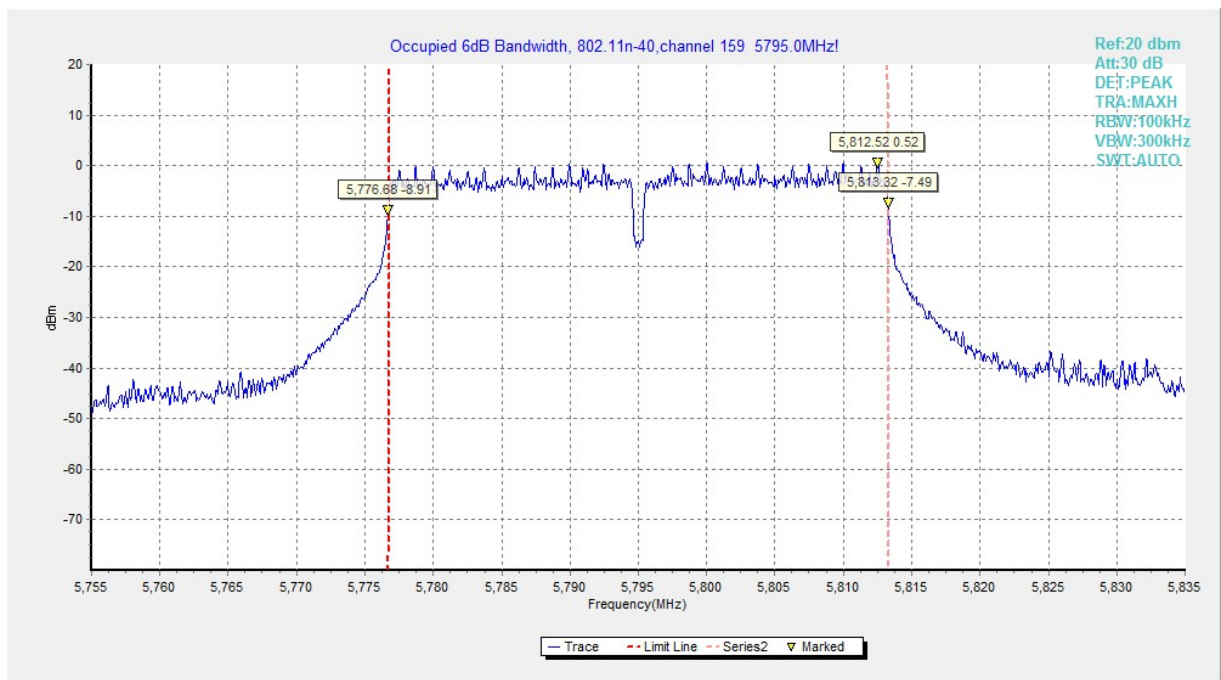


Fig. 13 Occupied 6dB Bandwidth (802.11n-HT40, 5795MHz)

A.6. 99% Occupied Bandwidth(conducted)

Measurement Limit:

Standard	Limit (MHz)
FCC 47 CFR Part 15.403	/

The measurement is made according to KDB 789033

Measurement Result:

Mode	Channel	99% Occupied Bandwidth(MHz)		Conclusion
802.11a	5180MHz(Ch36)	Fig.14	16.54	P
	5200MHz(Ch40)	Fig.15	16.50	P
	5240MHz(Ch48)	Fig.16	16.50	P
802.11n HT20	5180MHz(Ch36)	Fig.17	17.54	P
	5200MHz(Ch40)	Fig.18	17.58	P
	5240MHz(Ch48)	Fig.19	17.54	P
802.11n HT40	5190MHz(Ch38)	Fig.20	35.96	P
	5230MHz(Ch46)	Fig.21	35.96	P

Conclusion: PASS

Test graphs as below:

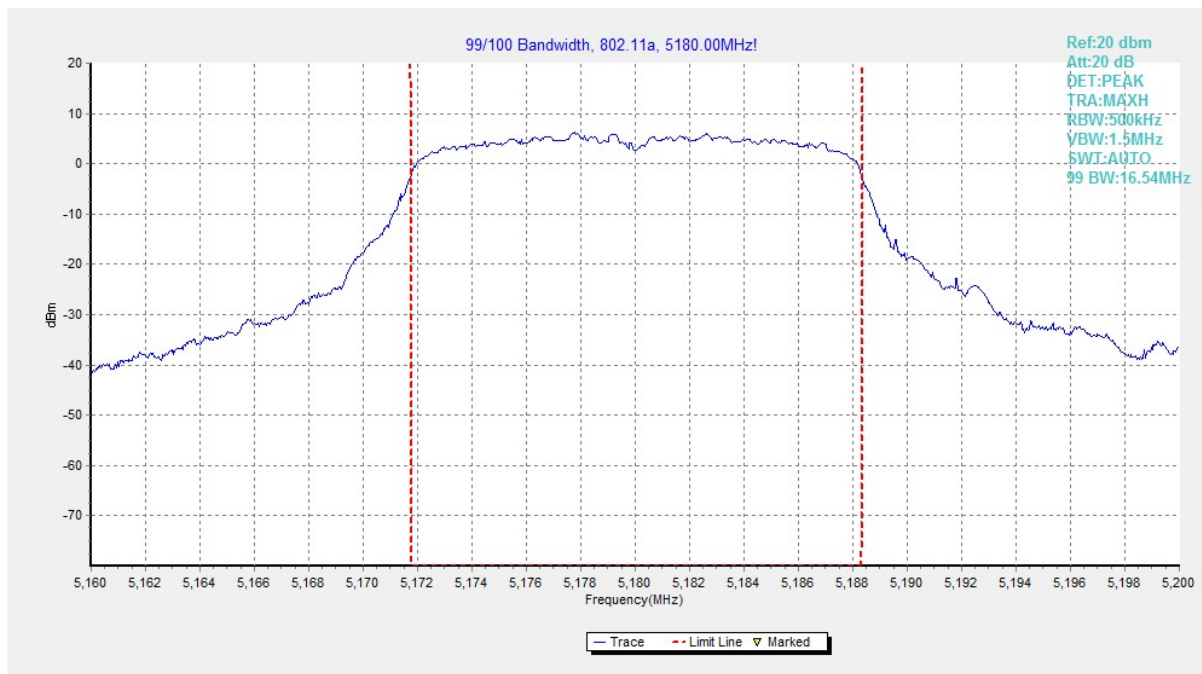


Fig. 14 99% Occupied Bandwidth (802.11a, 5180MHz)

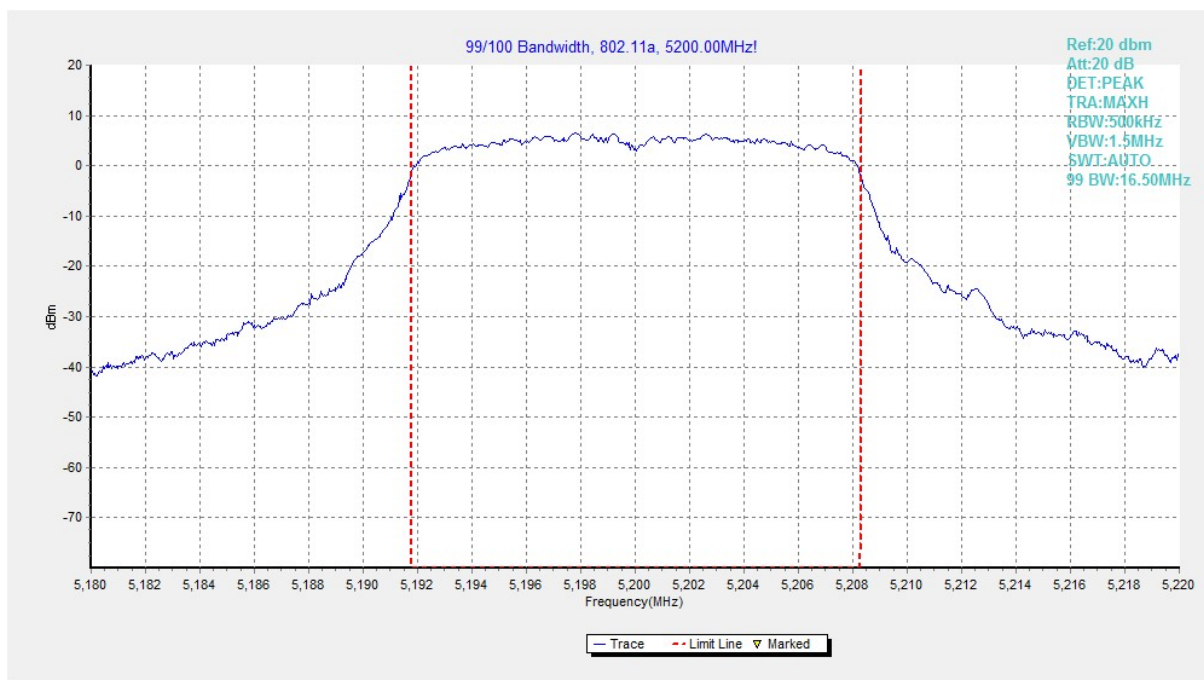


Fig. 15 99% Occupied Bandwidth (802.11a, 5200MHz)

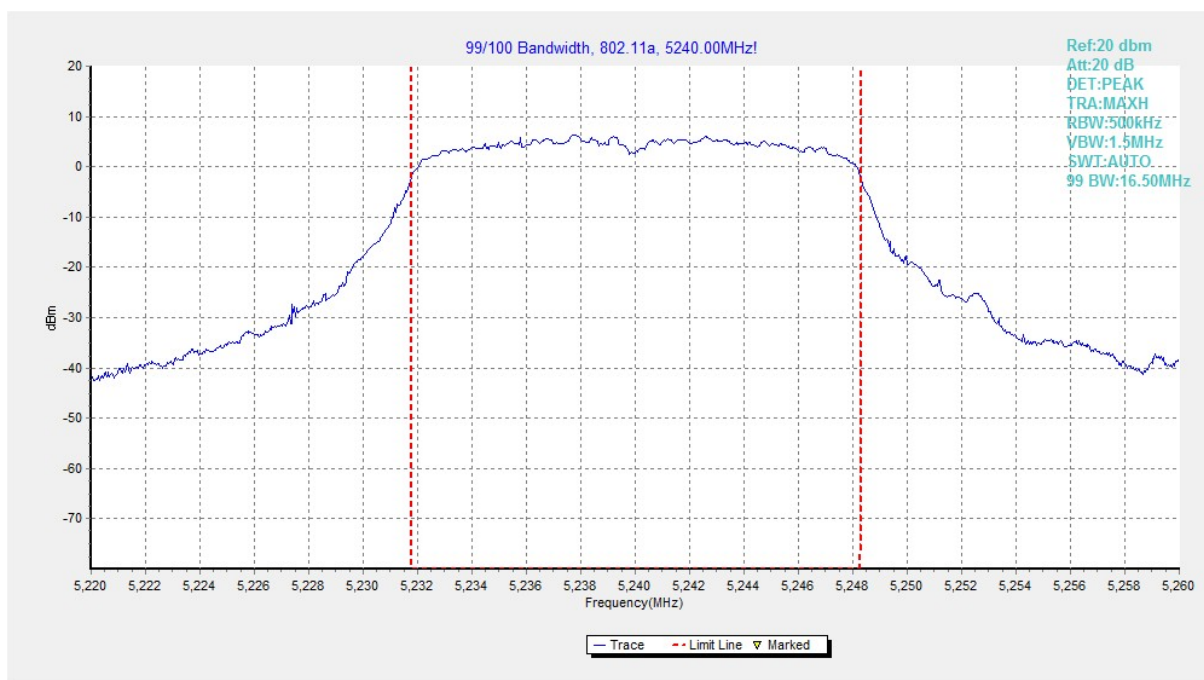


Fig. 16 99% Occupied Bandwidth (802.11a, 5240MHz)

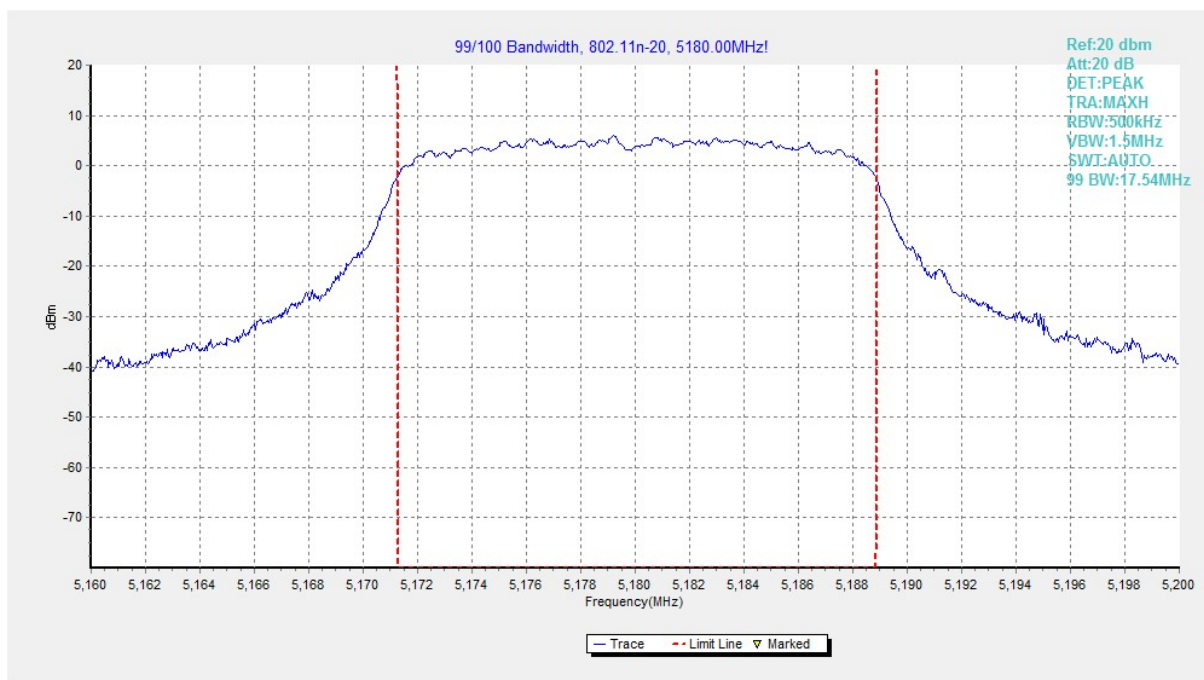


Fig. 17 99% Occupied Bandwidth (802.11n-HT20, 5180MHz)

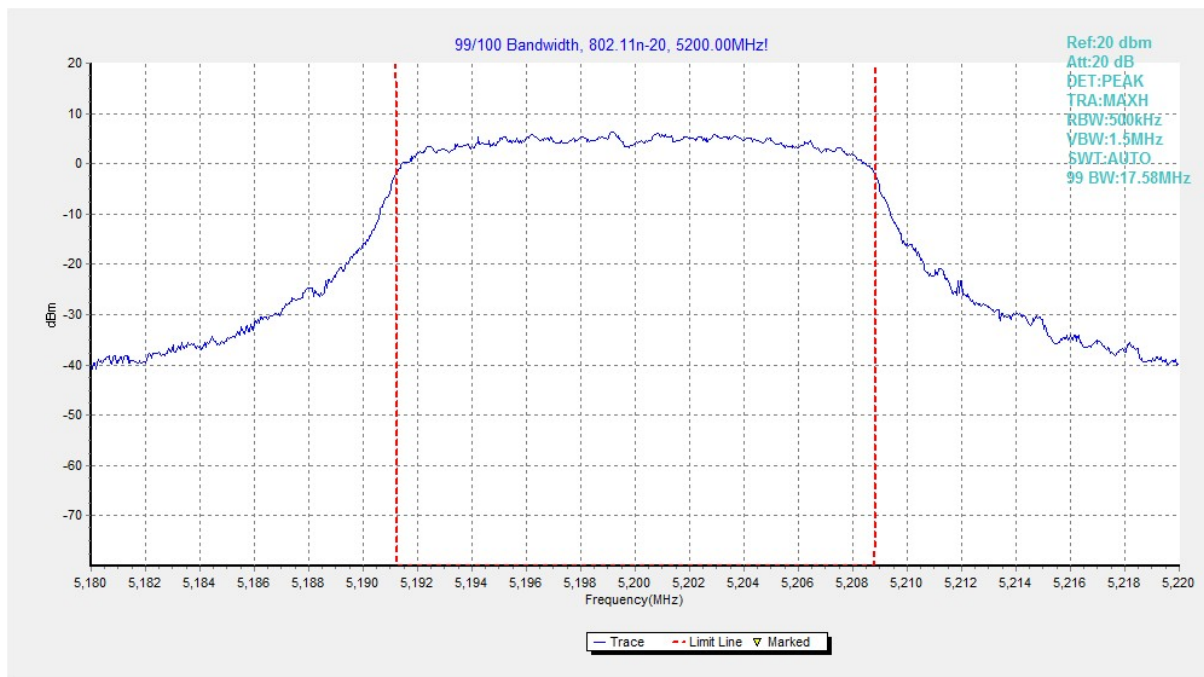


Fig. 18 99% Occupied Bandwidth (802.11n-HT20, 5200MHz)

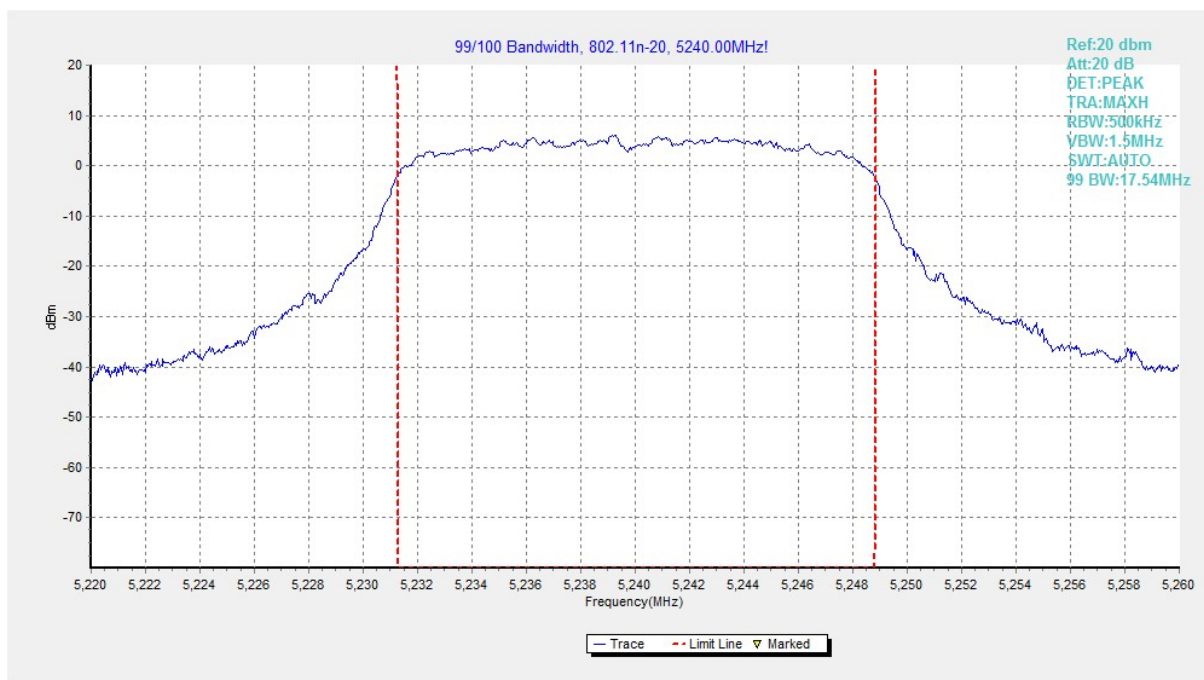


Fig. 19 99% Occupied Bandwidth (802.11n-HT20, 5240MHz)

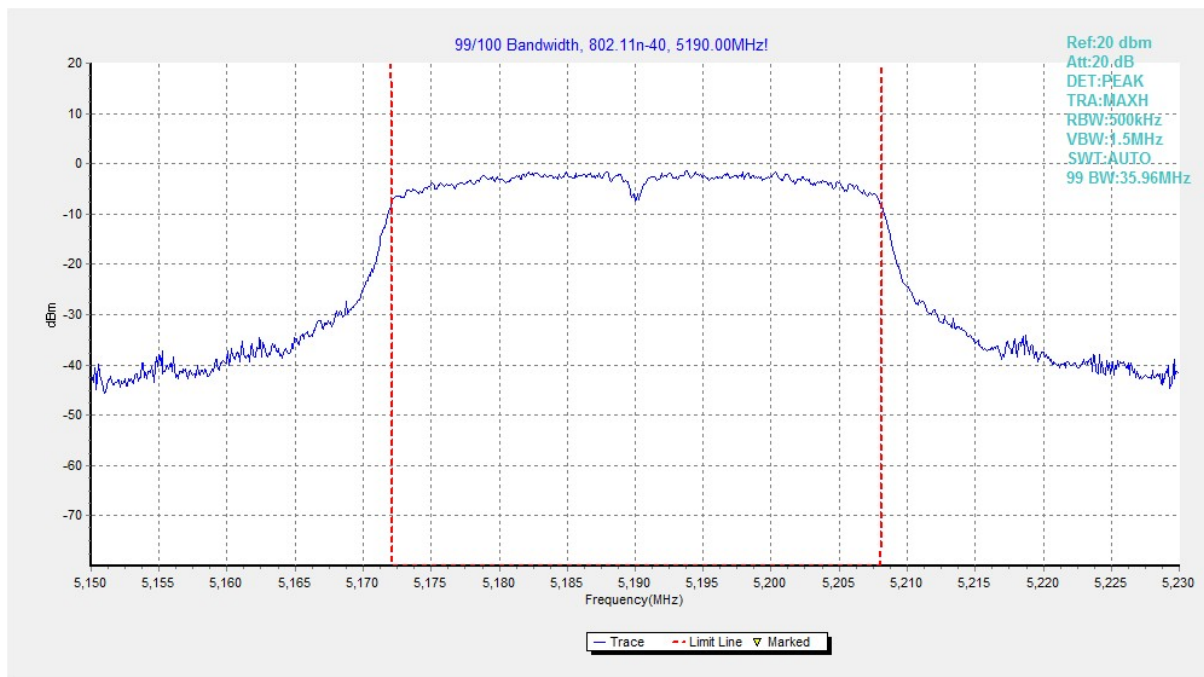


Fig. 20 99% Occupied Bandwidth (802.11n-HT40, 5190MHz)

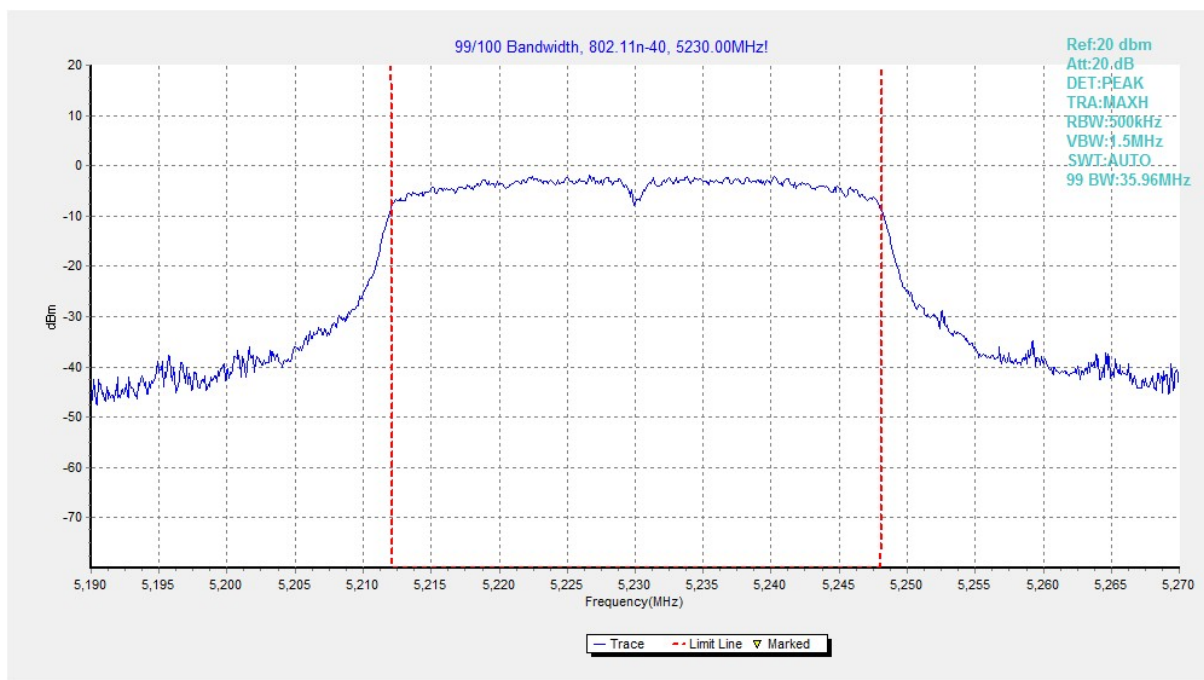


Fig. 21 99% Occupied Bandwidth (802.11n-HT40, 5230MHz)

A.7. Frequency Stability

Manufacturers ensured the EUT meet the requirement of frequency stability, such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

Measurement Result:

Mode	Channel	Condition		Frequency	Conclusion
802.11a	5180 MHz (CH36)	T nom	V nom	5179.9855	P
		T max	V nom	5179.9863	P
		T min	V nom	5179.9764	P
		T nom	V max	5179.9839	P
		T nom	V min	5179.9773	P
802.11n HT40	5755 MHz (CH151)	T nom	V nom	5755.9531	P
		T max	V nom	5755.9718	P
		T min	V nom	5755.9744	P
		T nom	V max	5755.9848	P
		T nom	V min	5755.9752	P

A.8. Power control

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

***** END OF REPORT BODY *****