FCC PART 15
TEST REPORT
No. I21Z70530-IOT10

for

Samsung Electronics Co., Ltd.

Multi-band GSM/WCDMA/LTE phone with Bluetooth, WLAN

SM-A035G/DSN

FCC ID: ZCASMA035G

with

Hardware Version: REV1.0

Software Version: A035G.001

Issued Date: 2021-11-23

Note:

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REPORT HISTORY

Report Number	Revision	Description	Issue Date
I21Z70530-IOT10	Rev.0	1st edition	2021-11-18
I21Z70530-IOT10	Rev.1	Update the statements on page 11.	2021-11-23

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1. TEST LATORATORY

1.1. Introduction & Accreditation

Telecommunication Technology Labs, CAICT is an ISO/IEC 17025:2017 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 (ISED#: 24849). The detail accreditation scope can be found on NVLAP website.

1.2. Testing Location

Testing Location: CTTL(huayuan North Road)

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

1.3. Testing Environment

Normal Temperature: 15-35℃

Relative Humidity: 20-75%

1.4. Project date

Testing Start Date: 2021-08-13

Testing End Date: 2021-11-18

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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:	Samsung Electronics Co., Ltd.
Address	19 Chapin Rd.,Building D Pine Brook, NJ 07058
Contact:	Jenni Chun
Email:	j1.chun@samsung.com
Tel:	+1-201-937-4203
Fax:	/

2.2. Manufacturer Information

Company Name:	Samsung Electronics Co., Ltd.
Address	Samsung R5, Maetan dong 129, Samsung ro Youngtong gu, Suwon city 443 742, Korea
Contact:	Sunghoon Cho
Email:	ggobi.cho@samsung.com
Tel:	+82-10-2722-4159
Fax:	/

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

3.1. About EUT

Description	Multi-band GSM/WCDMA/LTE phone with Bluetooth, WLAN
Model name	SM-A035G/DSN
FCC ID	ZCASMA035G
WLAN Frequency Band	ISM Bands: -5150MHz~5250MHz -5250MHz~5350MHz -5470MHz~5725MHz
Type of modulation	OFDM
Antenna gain	-1dBi
Voltage	3.85V

3.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version
UT20a	2170530UT20a	REV1.0	A035G.001
UT13a	2170530UT13a	REV1.0	A035G.001

*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	Remark
AE1	Adapter1	/
AE2	Adapter2	/
AE3	Adapter3	/
AE4	Adapter4	/
AE5	Adapter5	/
AE6	Adapter6	/
AE7	Adapter7	/
AE8	Adapter8	/
AE9	USB Cable	/
AE10	Headset1	/
AE11	Headset2	/
AE12	Battery1	/
AE13	Battery2	/

AE1

Model	EP-TA50JWS
Manufacturer	RFTECH Co., Ltd.

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Length of cable	/
AE2	
Model	EP-TA50JWS
Manufacturer	HAMEN
Length of cable	/
AE3	
Model	EP-TA50EWE
Manufacturer	DY
Length of cable	/
AE4	
Model	EP-TA50EWE
Manufacturer	HAMEN
Length of cable	/
AE5	
Model	EP-TA50EWE
Manufacturer	Salcomp
Length of cable	/
AE6	
Model	EP-TA50UWE
Manufacturer	DY
Length of cable	/
AE7	
Model	EP-TA50UWE
Manufacturer	HAMEN
Length of cable	/
AE8	
Model	EP- TA50UWE
Manufacturer	Salcomp
Length of cable	/
AE9	
Model	ECB-DU68WE
Manufacturer	Samsung Electronics Co., Ltd.
Length	/ /
AE10	
Model	EHS61ASFWE
Manufacturer	CRESYN HANOI Co., Ltd
Length	/
AE11	
Model	EHS61ASFWE
Manufacturer	DONGGUAN YOUNGBO ELECTRONICS CO.,LTD
Length	/
AE12	
TYPE	Secondary Li-ion Battery

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SN HQ-50SD
Manufacturer SCUD (Fujian) Electronics CO.,LTD
AE13
TYPE Secondary Li-ion Battery
SN HQ-50N
Manufacturer SCUD (Fujian) Electronics 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 Multi-band GSM/WCDMA/LTE phone with Bluetooth, WLAN with integrated antenna and inbuilt battery.
The Equipment under Test (EUT) is a model of
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
KDB 558074 D01	Federal Communications Commission Office of Engineering and Technology Laboratory Division	2019

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5. LABORATORY ENVIRONMENT

Conducted RF performance testing is performed in shielding room.

EMC performance testing is performed in Semi-anechoic chamber.

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	/	**BR**
Peak Power Spectral Density	15.407	/	**BR**
Occupied 26dB Bandwidth	15.403	/	**BR**
Band edge compliance (Radiated)	15.209	/	**P**
Transmitter spurious emissions (Radiated)	15.407	/	**P**
AC Powerline Conducted Emission (150kHz- 30MHz)	15.407	/	**P**
Frequency Stability	15.407	/	**P**
99% Occupied bandwidth	/	/	**BR**
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
BR	Re-use test data from basic model report.
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.

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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%

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	2020-05-15
2	LISN	ENV216	101200	R&S	1 year	2022-05-30
3	Test Receiver	ESCI	100344	R&S	1 year	2022-02-23
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	100235	Rohde & Schwarz	1 year	2022-02-23
2	BiLog Antenna	VULB9163	9163-01223	Schwarzbeck	1 year	2022-03-22
3	Antenna	3115	6914	ETS-Lindgren	1 year	2022-02-03
4	Dual-Ridge Waveguide Horn Antenna	3116	2661	ETS-Lindgren	1 year	2022-01-05
5	Analytical Spectrometer	FSV40	R&S	101047	1 year	2022-05-17

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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	5.16
1GHz ≤ f ≤18GHz	5.44
18GHz ≤ f ≤40GHz	5.28

8.6 AC Power-line Conducted Emission

Measurement Uncertainty : 3.08,k=2

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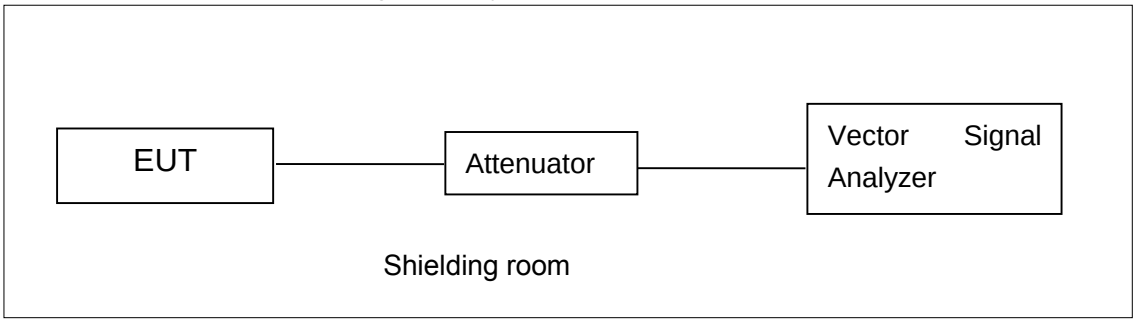
ANNEX A: MEASUREMENT RESULTS

A.1. Measurement Method

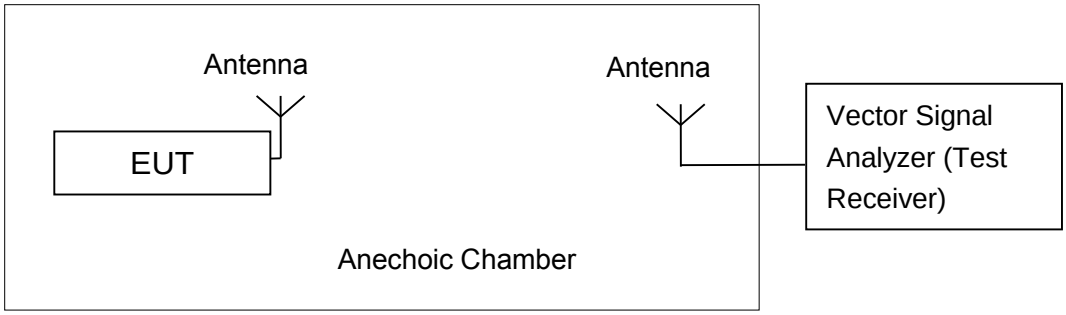
A.1.1. Conducted Measurements

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



A.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 = 3MHz



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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A.2. Maximum output Power

Measurement Limit and Method:

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

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	Frequency	Test Result (dBm)							
		Data Rate (Mbps)							
		6	9	12	18	24	36	48	54
802.11a	5180MHz	15.95	/	/	16.01	/	/	/	/
	5200MHz	16.38	16.36	16.32	16.44	15.13	14.68	14.19	14.17
	5240MHz	16.15	/	/	16.09	/	/	/	/
	5260MHz	16.28	/	/	16.08	/	/	/	/
	5280MHz	16.39	/	/	15.97	/	/	/	/
	5320MHz	16.09	/	/	15.88	/	/	/	/
	5500MHz	15.76	/	/	15.66	/	/	/	/
	5580MHz	15.49	/	/	16.26	/	/	/	/
	5700MHz	15.40	/	/	15.08	/	/	/	/
	5720MHz	15.03	/	/	/	/	/	/	/

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

802.11n-HT20 mode

Mode	Frequency	Test Result (dBm)							
		Data Rate							
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
802.11n (HT20)	5180MHz	16.02	16.10	16.28	16.17	16.15	16.06	13.95	13.49
	5200MHz	/	/	16.82	/	/	/	/	/
	5240MHz	/	/	16.97	/	/	/	/	/
	5260MHz	/	/	16.72	/	/	/	/	/
	5280MHz	/	/	16.94	/	/	/	/	/
	5320MHz	/	/	16.24	/	/	/	/	/
	5500MHz	/	/	15.82	/	/	/	/	/
	5580MHz	/	/	16.38	/	/	/	/	/
	5700MHz	/	/	15.47	/	/	/	/	/
	5720MHz	/	/	15.28	/	/	/	/	/

The data rate MCS2 is selected as worse condition, and the following cases are performed with

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this condition.

802.11ac-HT20 mode

Mode	Frequency	Test Result (dBm)								
		Data Rate								
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	MCS8
802.11ac (HT20)	5180MHz	15.32	15.17	14.25	14.13	13.68	13.22	13.12	12.84	11.56
	5200MHz	15.78	/	/	/	/	/	/	/	/
	5240MHz	15.87	/	/	/	/	/	/	/	/
	5260MHz	15.98	/	/	/	/	/	/	/	/
	5280MHz	15.76	/	/	/	/	/	/	/	/
	5320MHz	15.75	/	/	/	/	/	/	/	/
	5500MHz	14.96	/	/	/	/	/	/	/	/
	5580MHz	15.52	/	/	/	/	/	/	/	/
	5700MHz	14.71	/	/	/	/	/	/	/	/
	5720MHz	14.36	/	/	/	/	/	/	/	/

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

802.11n-HT40 mode

Mode	Frequency	Test Result (dBm)							
		Data Rate							
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
802.11n (HT40)	5190MHz	16.70	16.00	15.98	15.89	15.53	13.61	13.66	13.20
	5230MHz	16.51	/	/	/	/	/	/	/
	5270MHz	16.54	/	/	/	/	/	/	/
	5310MHz	16.35	/	/	/	/	/	/	/
	5510MHz	15.57	/	/	/	/	/	/	/
	5550MHz	15.33	/	/	/	/	/	/	/
	5670MHz	15.91	/	/	/	/	/	/	/
	5710MHz	15.45	/	/	/	/	/	/	/

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

802.11ac-HT40 mode

Mode	Frequency	Test Result (dBm)									
		Data Rate									
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	MCS8	MCS9
802.11ac (HT40)	5190MHz	15.76	15.56	14.41	14.25	13.77	13.80	13.32	13.10	12.24	10.24
	5230MHz	15.72	/	/	/	/	/	/	/	/	/
	5270MHz	15.53	/	/	/	/	/	/	/	/	/

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	5310MHz	15.15	/	/	/	/	/	/	/	/	/
	5510MHz	14.60	/	/	/	/	/	/	/	/	/
	5550MHz	14.94	/	/	/	/	/	/	/	/	/
	5670MHz	14.76	/	/	/	/	/	/	/	/	/
	5710MHz	14.31	/	/	/	/	/	/	/	/	/

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

802.11ac-HT80 mode

Mode	Frequency	Test Result (dBm)									
		Data Rate									
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	MCS8	MCS9
802.11ac (HT80)	5210MHz	16.19	15.74	14.73	14.67	14.12	14.04	13.61	13.58	12.49	10.38
	5290MHz	15.38	/	/	/	/	/	/	/	/	/
	5530MHz	14.47	/	/	/	/	/	/	/	/	/
	5610MHz	15.08	/	/	/	/	/	/	/	/	/
	5690MHz	14.46	/	/	/	/	/	/	/	/	/

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

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A.3. Peak Power Spectral Density (conducted)

Measurement Limit:

Standard	Frequency (MHz)	Limit (dBm/MHz)
FCC CRF Part 15.407(a)	5150MHz~5250MHz	11
	5250MHz~5350MHz	11
	5470MHz~5725MHz	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	4.12	P
	5200 MHz	4.82	P
	5240 MHz	5.06	P
	5260 MHz	5.11	P
	5280 MHz	4.84	P
	5320 MHz	4.42	P
	5500 MHz	3.71	P
	5580 MHz	4.68	P
	5700 MHz	3.44	P
	5720MHz	3.17	P
802.11n HT20	5180 MHz	4.32	P
	5200 MHz	4.70	P
	5240 MHz	4.95	P
	5260 MHz	4.81	P
	5280 MHz	4.60	P
	5320 MHz	4.26	P
	5500 MHz	3.64	P
	5580 MHz	4.09	P
	5700 MHz	3.23	P
	5720MHz	2.97	P
802.11n HT40	5190 MHz	1.70	P
	5230 MHz	1.98	P
	5270 MHz	1.71	P
	5310 MHz	1.32	P
	5510 MHz	0.50	P
	5550 MHz	0.75	P
	5670 MHz	0.46	P
	5710MHz	0.13	P
802.11ac HT80	5210MHz	-1.86	P
	5290MHz	-2.45	P

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	5530MHz	-3.72	P
	5610MHz	-3.15	P
	5690MHz	-3.66	P

Conclusion: PASS

A.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)	
802.11a	5180 MHz	35.15	P
	5200 MHz	33.65	P
	5240 MHz	34.90	P
	5260 MHz	33.00	P
	5280 MHz	34.90	P
	5320 MHz	33.30	P
	5500 MHz	33.10	P
	5580 MHz	36.55	P
	5700 MHz	36.75	P
	5720 MHz	33.10	P
802.11n HT20	5180 MHz	34.15	P
	5200 MHz	30.70	P
	5240 MHz	28.85	P
	5260 MHz	28.80	P
	5280 MHz	29.55	P
	5320 MHz	30.05	P
	5500 MHz	28.10	P
	5580 MHz	30.05	P
	5700 MHz	29.75	P
	5720 MHz	30.70	P
802.11n (HT40)	5190 MHz	41.84	P

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	5230 MHz	49.60	P
	5270 MHz	43.76	P
	5310 MHz	43.92	P
	5510 MHz	45.60	P
	5550 MHz	44.16	P
	5670 MHz	45.76	P
	5710 MHz	44.64	P
802.11ac (HT80)	5210MHz	93.12	P
	5290MHz	91.52	P
	5530MHz	87.52	P
	5610MHz	96.00	P
	5690MHz	99.84	P

Conclusion: PASS

Test graphs as below:

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

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

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

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Fig.4 Occupied 26dB Bandwidth (802.11a, 5260MHz)

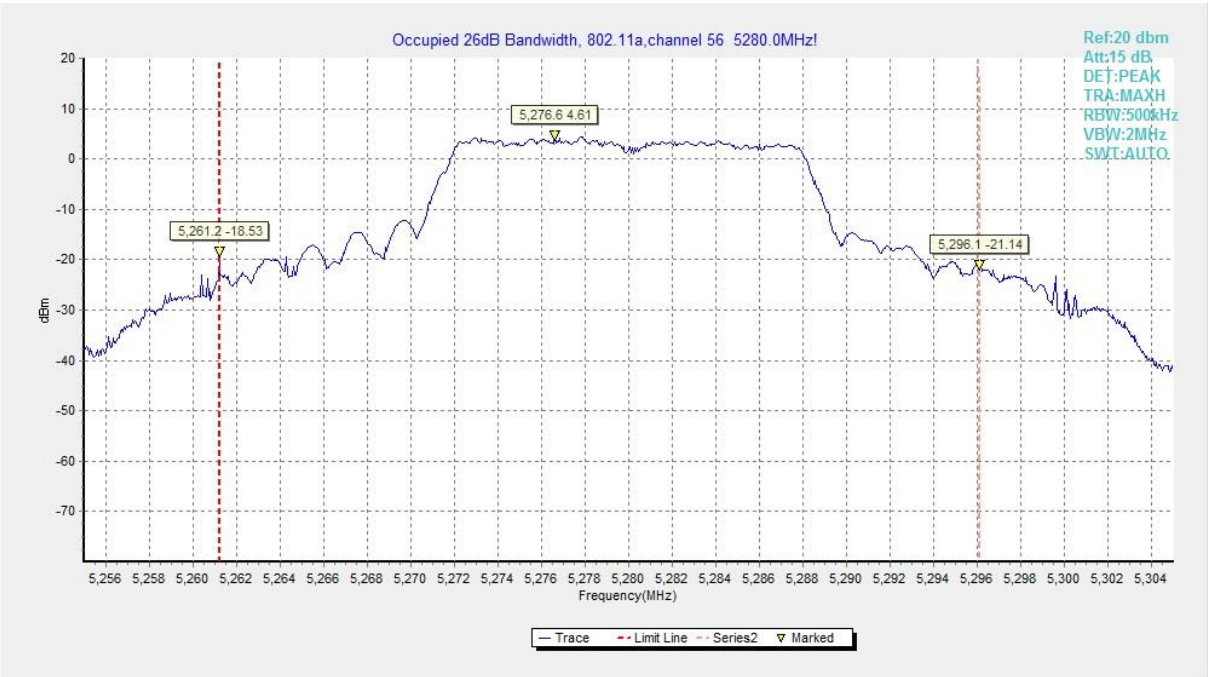

Fig.5 Occupied 26dB Bandwidth (802.11a, 5280MHz)

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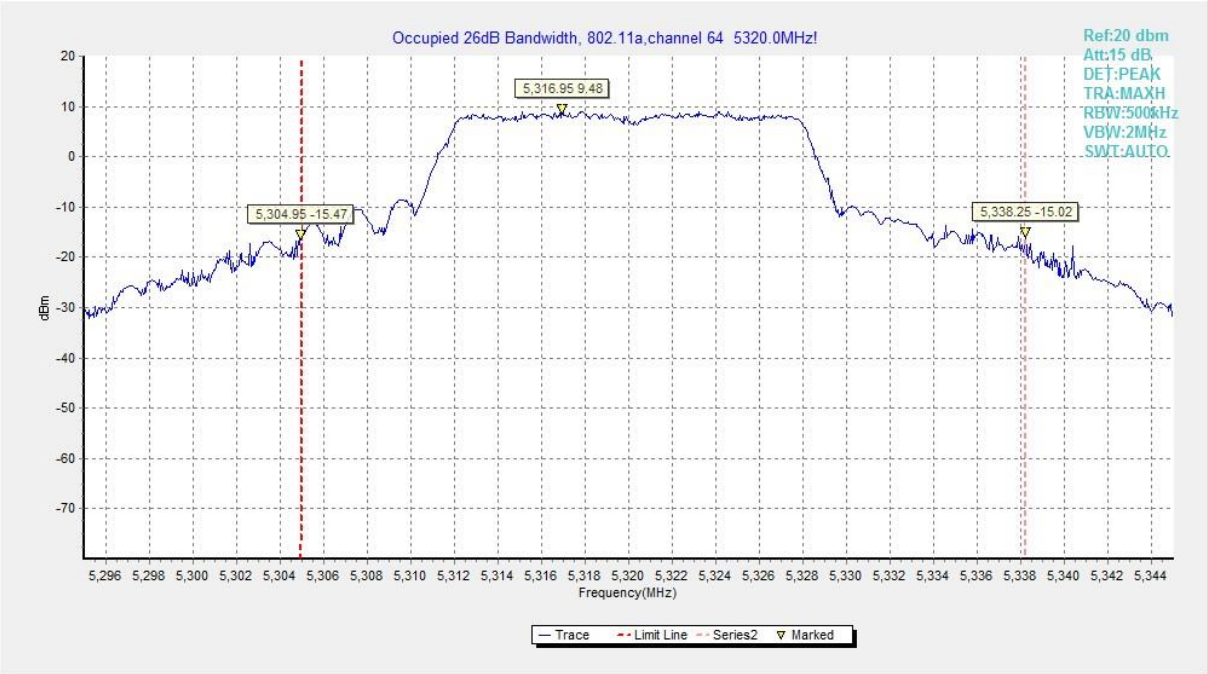

Fig.6 Occupied 26dB Bandwidth (802.11a, 5320MHz)

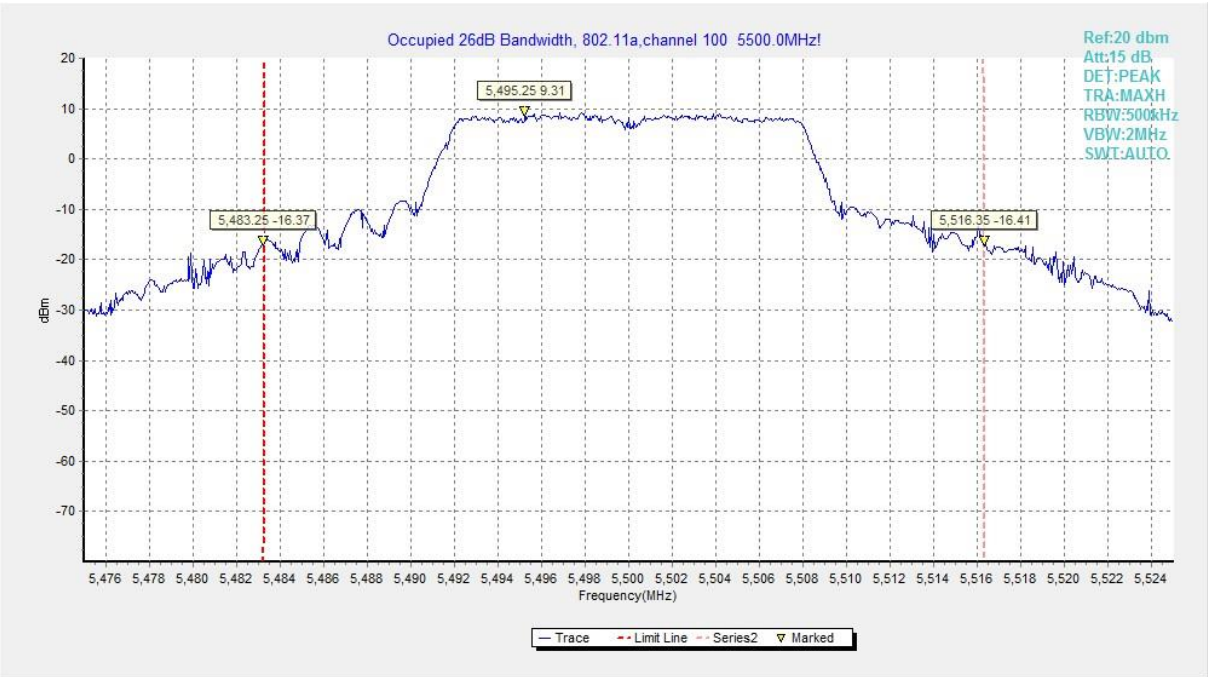

Fig.7 Occupied 26dB Bandwidth (802.11a, 5500MHz)

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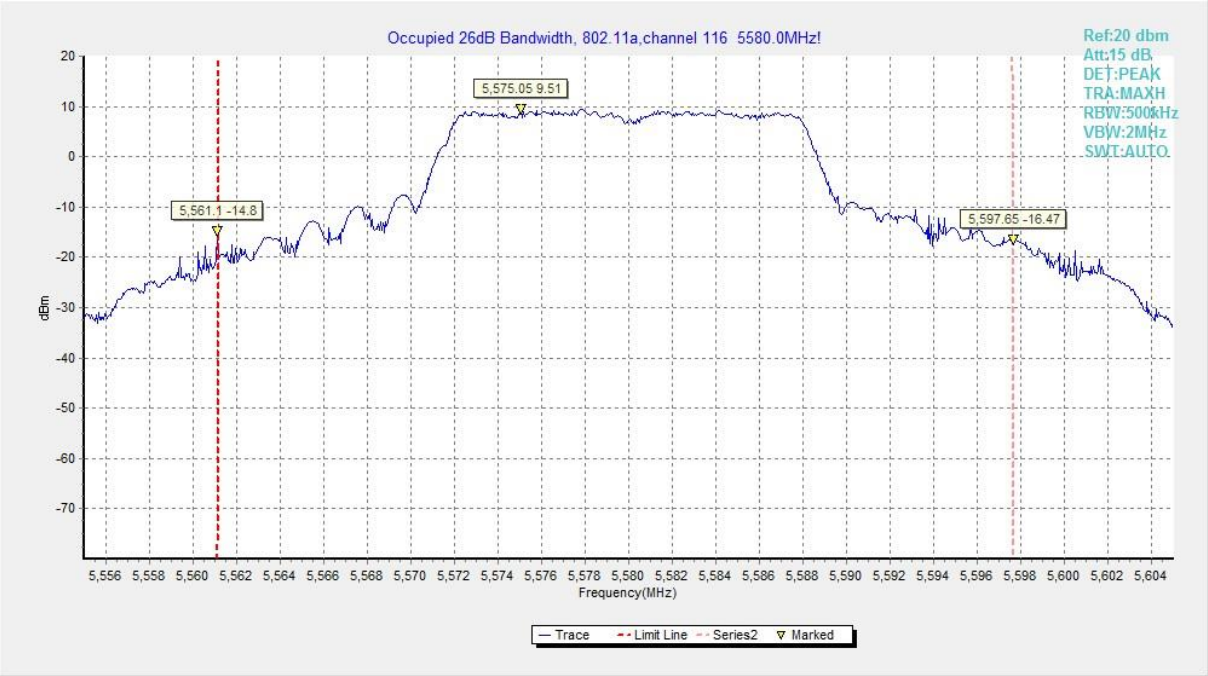

Fig.8 Occupied 26dB Bandwidth (802.11a, 5580MHz)

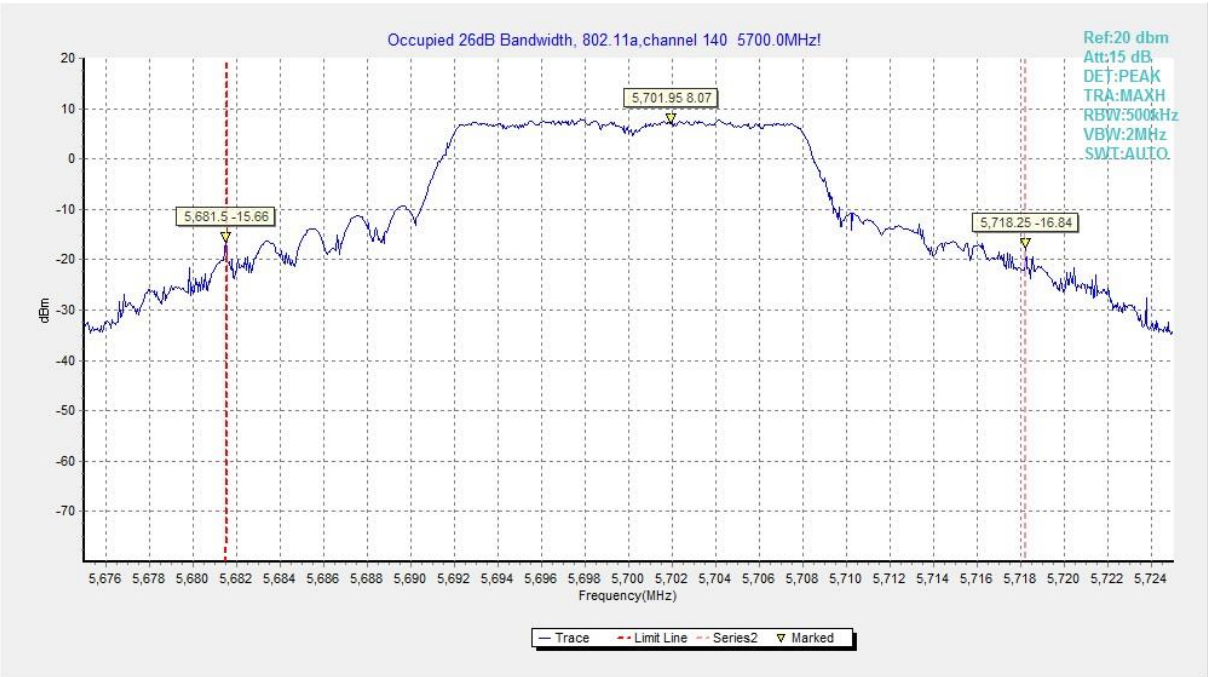

Fig.9 Occupied 26dB Bandwidth (802.11a, 5700MHz)

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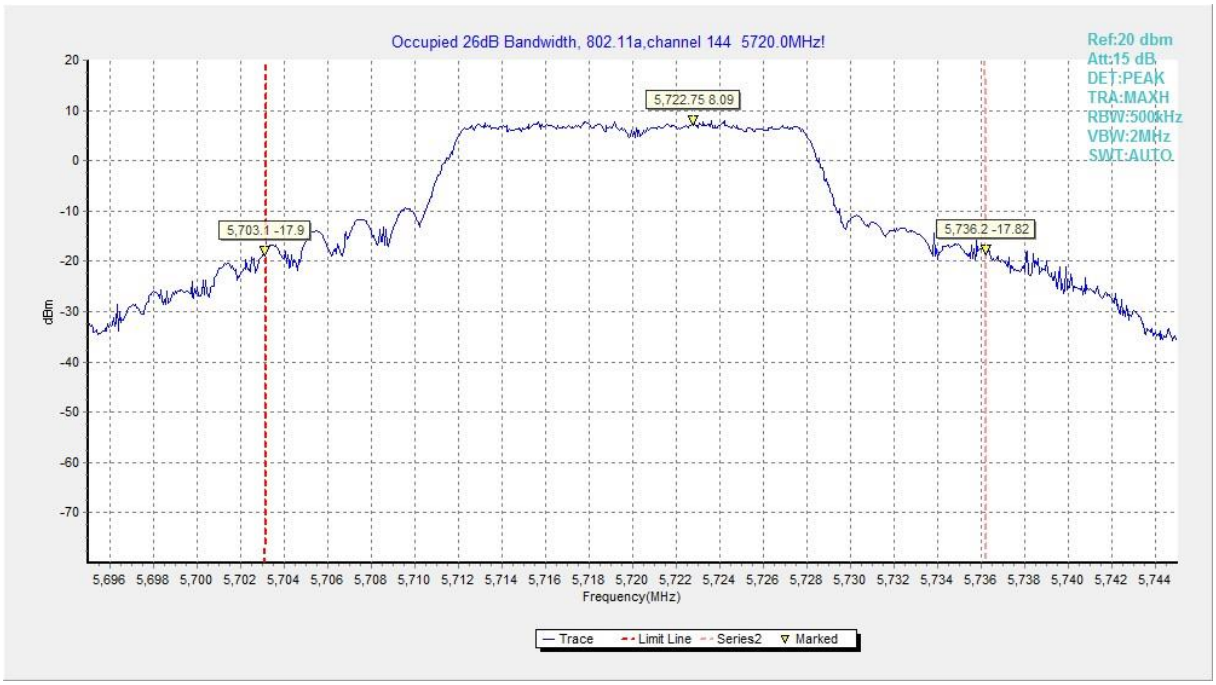

Fig.10 Occupied 26dB Bandwidth (802.11a, 5720MHz)

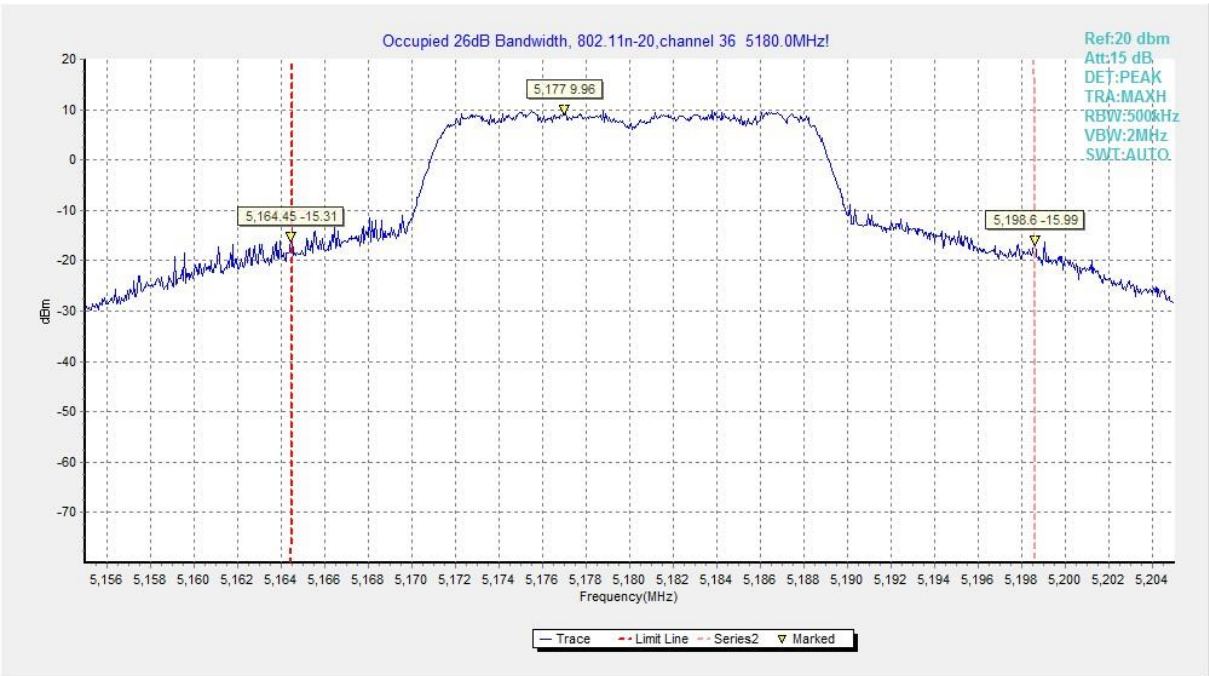

Fig.11 Occupied 26dB Bandwidth (802.11n-HT20, 5180MHz)

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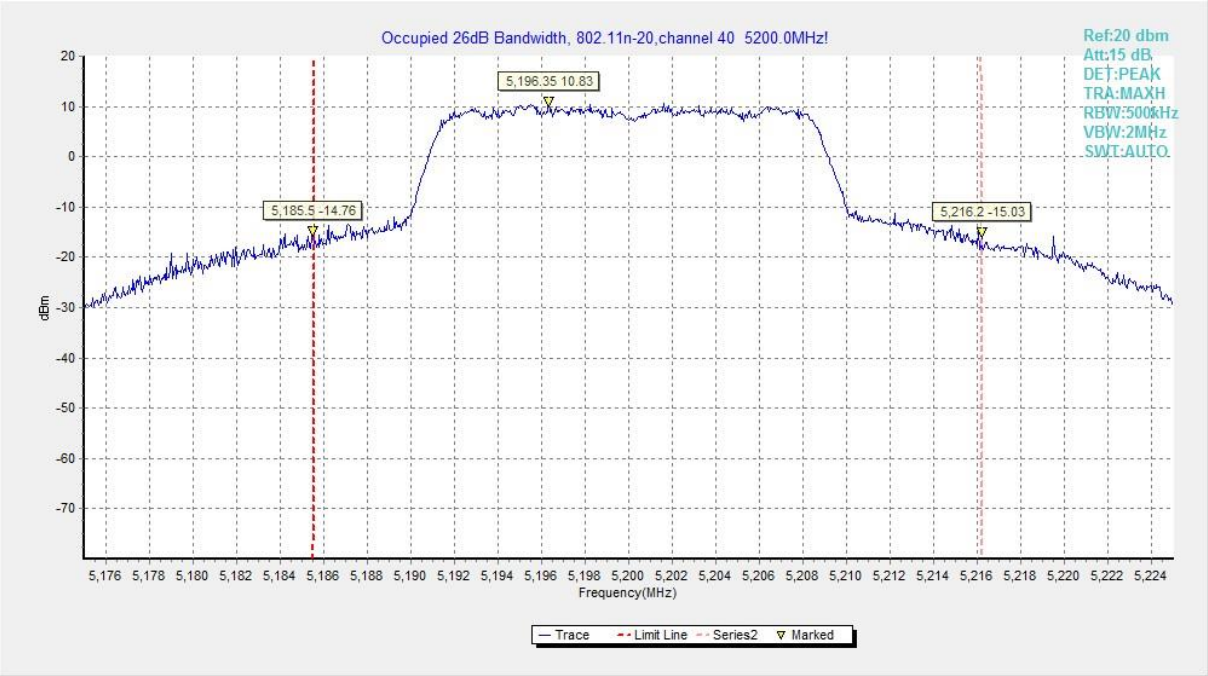

Fig.12 Occupied 26dB Bandwidth (802.11n-HT20, 5200MHz)

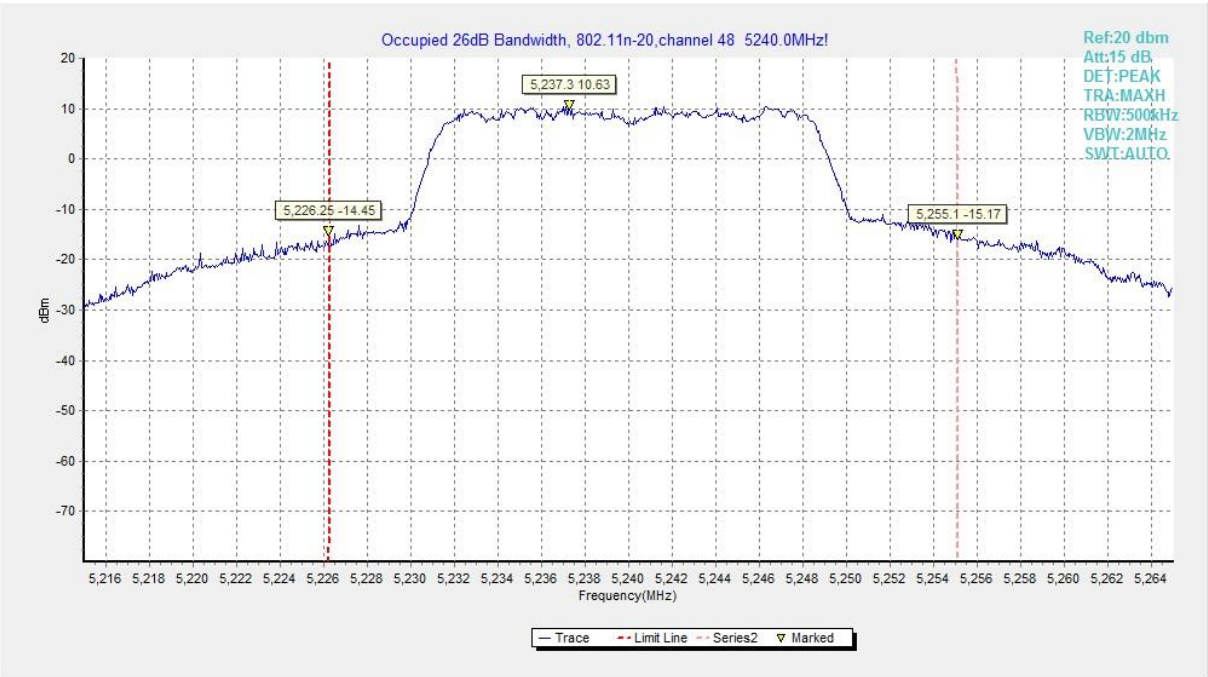

Fig.13 Occupied 26dB Bandwidth (802.11n-HT20, 5240MHz)

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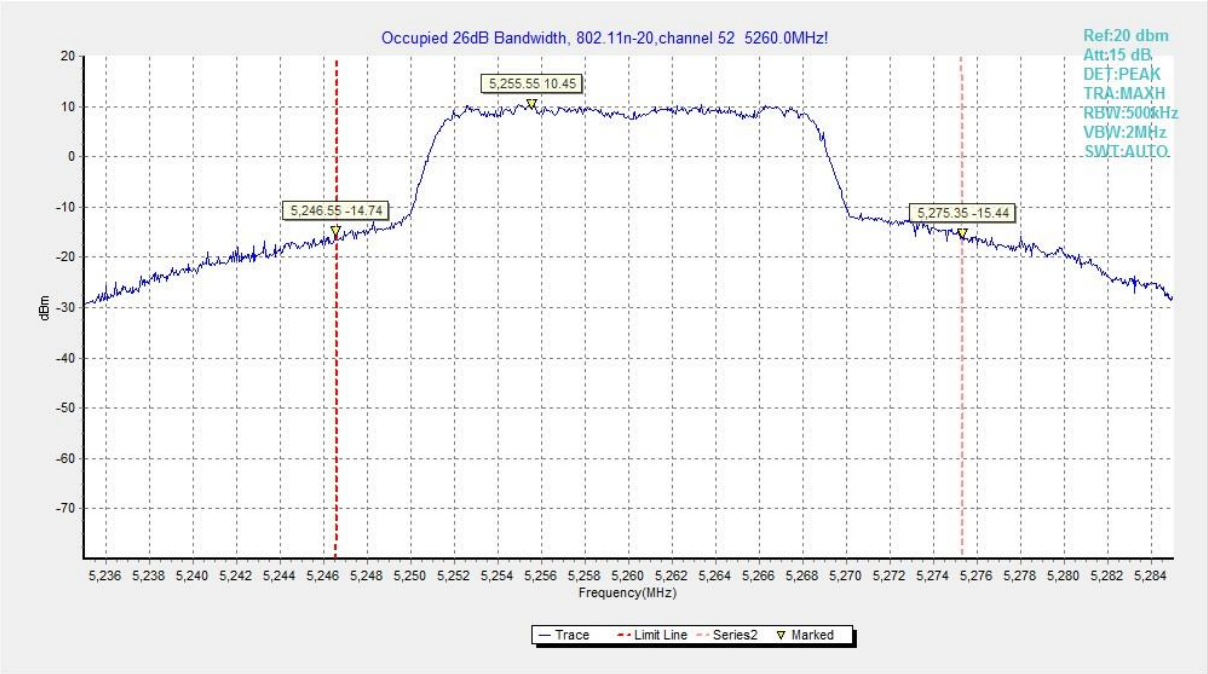

Fig.14 Occupied 26dB Bandwidth (802.11n-HT20, 5260MHz)

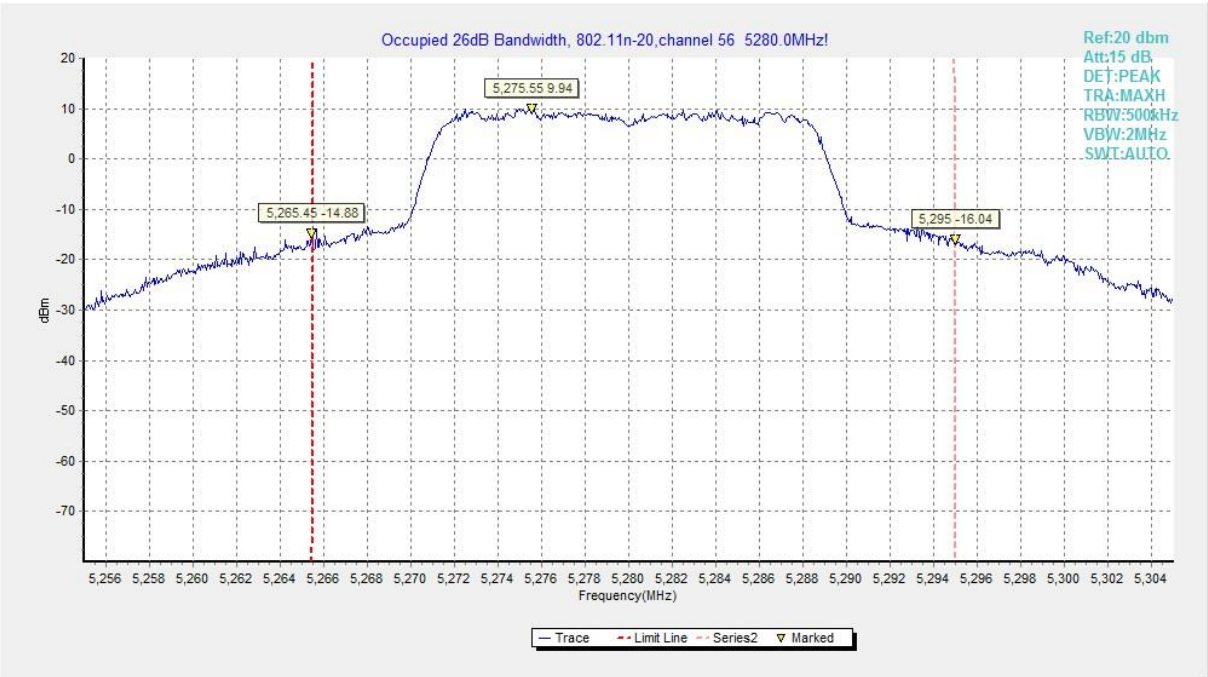

Fig.15 Occupied 26dB Bandwidth (802.11n-HT20, 5280MHz)

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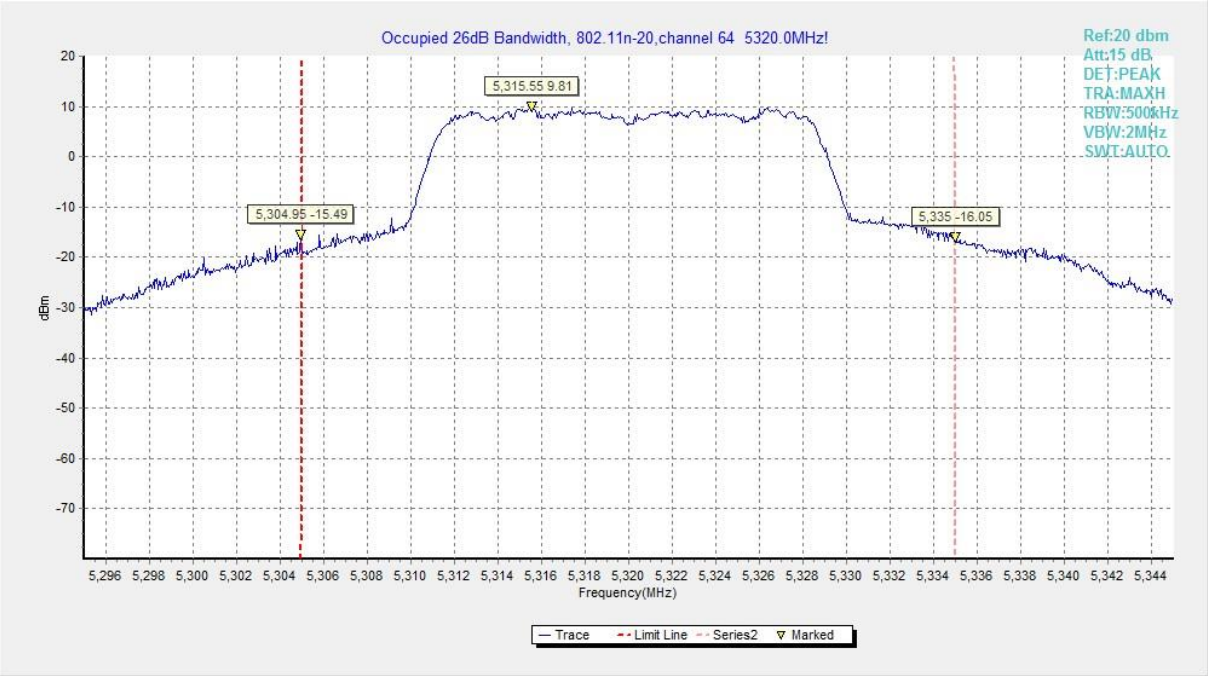

Fig.16 Occupied 26dB Bandwidth (802.11n-HT20, 5320MHz)

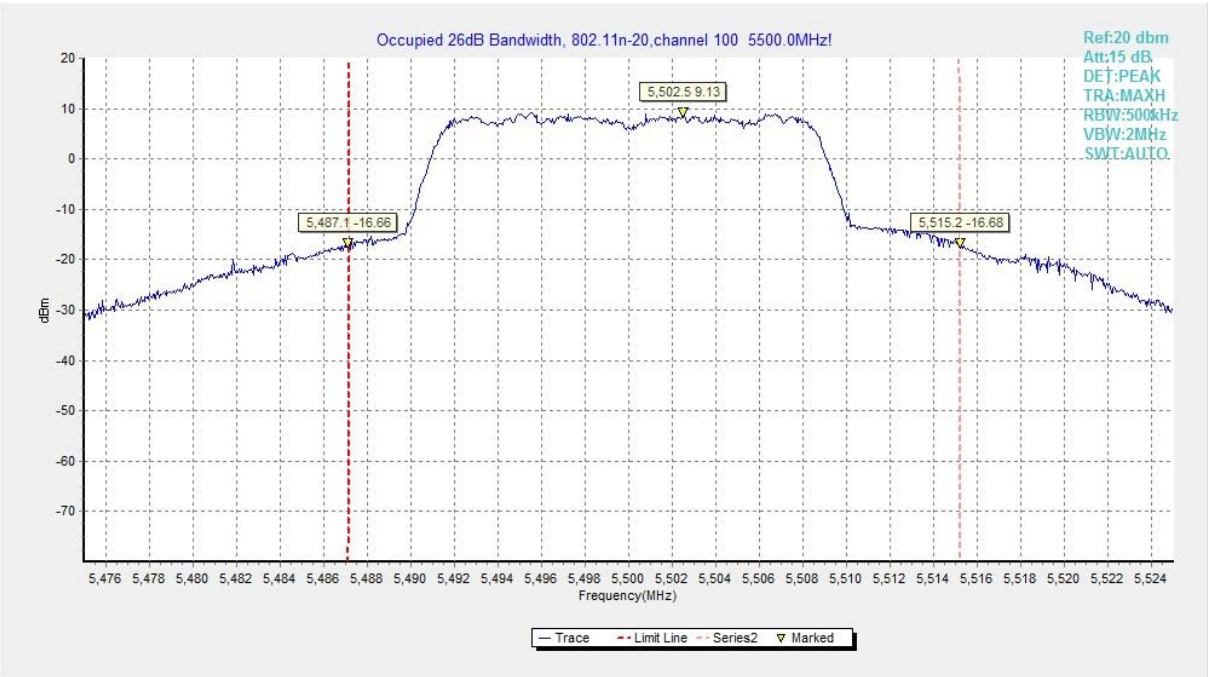

Fig.17 Occupied 26dB Bandwidth (802. 11n-HT20, 5500MHz)

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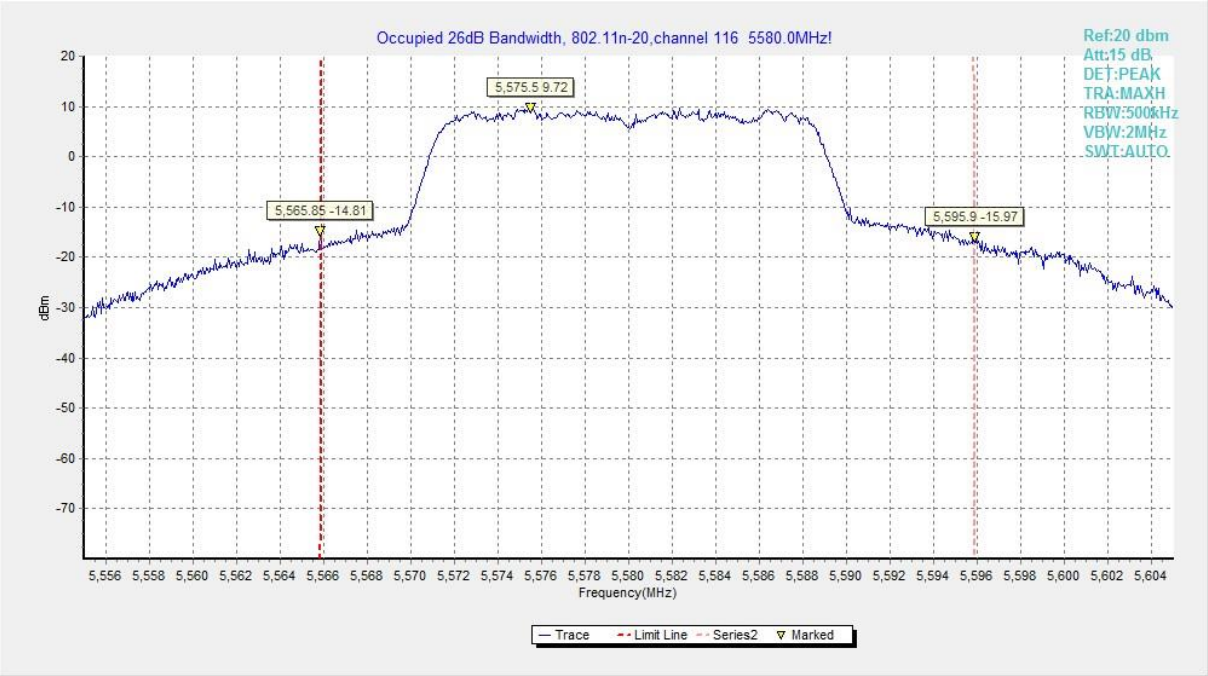

Fig.18 Occupied 26dB Bandwidth (802. 11n-HT20, 5580MHz)

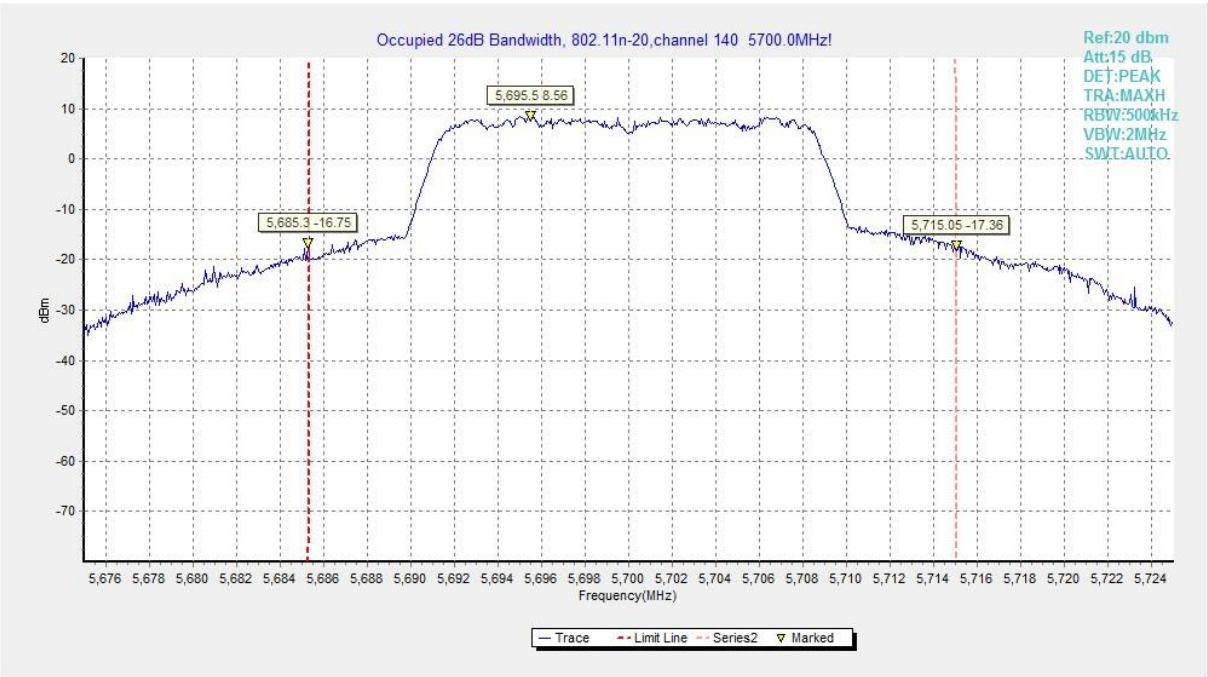

Fig.19 Occupied 26dB Bandwidth (802. 11n-HT20, 5700MHz)

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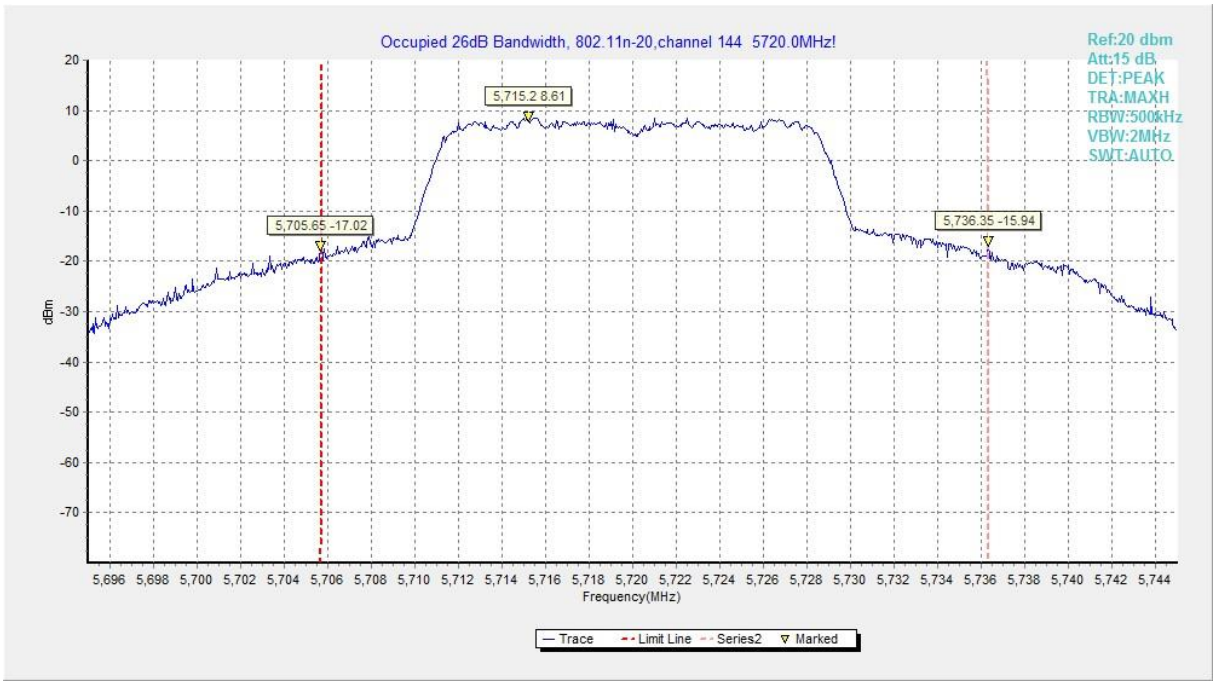

Fig.20 Occupied 26dB Bandwidth (802. 11n-HT20, 5720MHz)

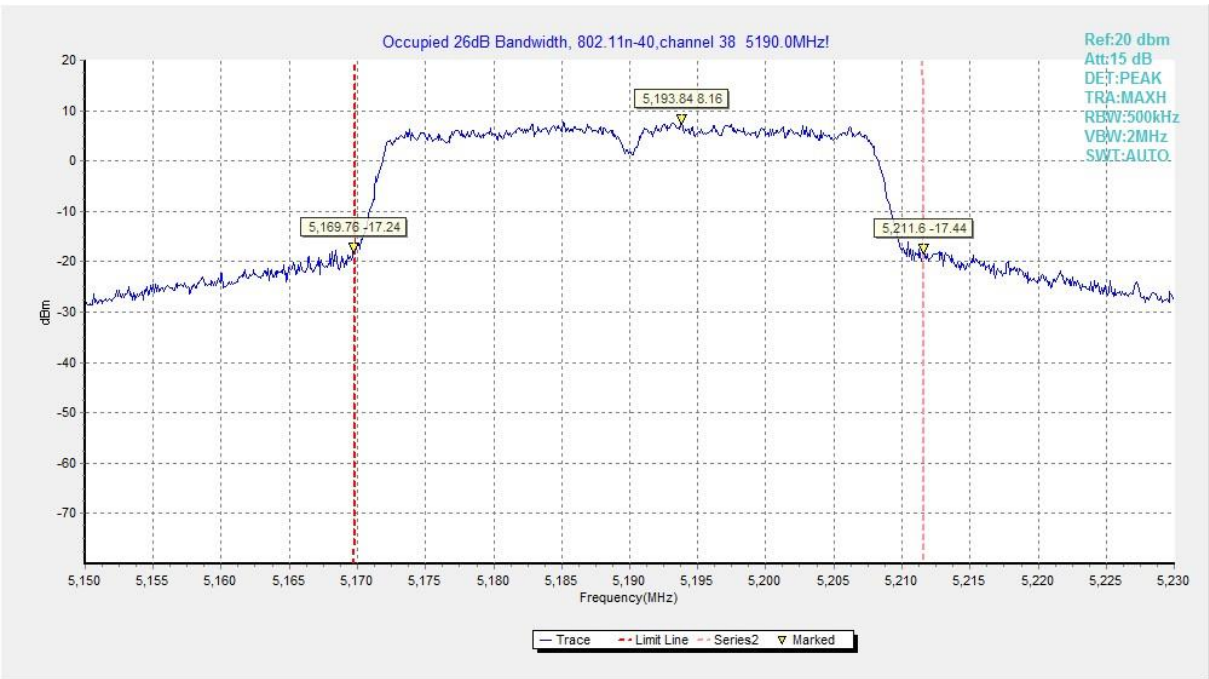

Fig.21 Occupied 26dB Bandwidth (802.11n-HT40, 5190MHz)

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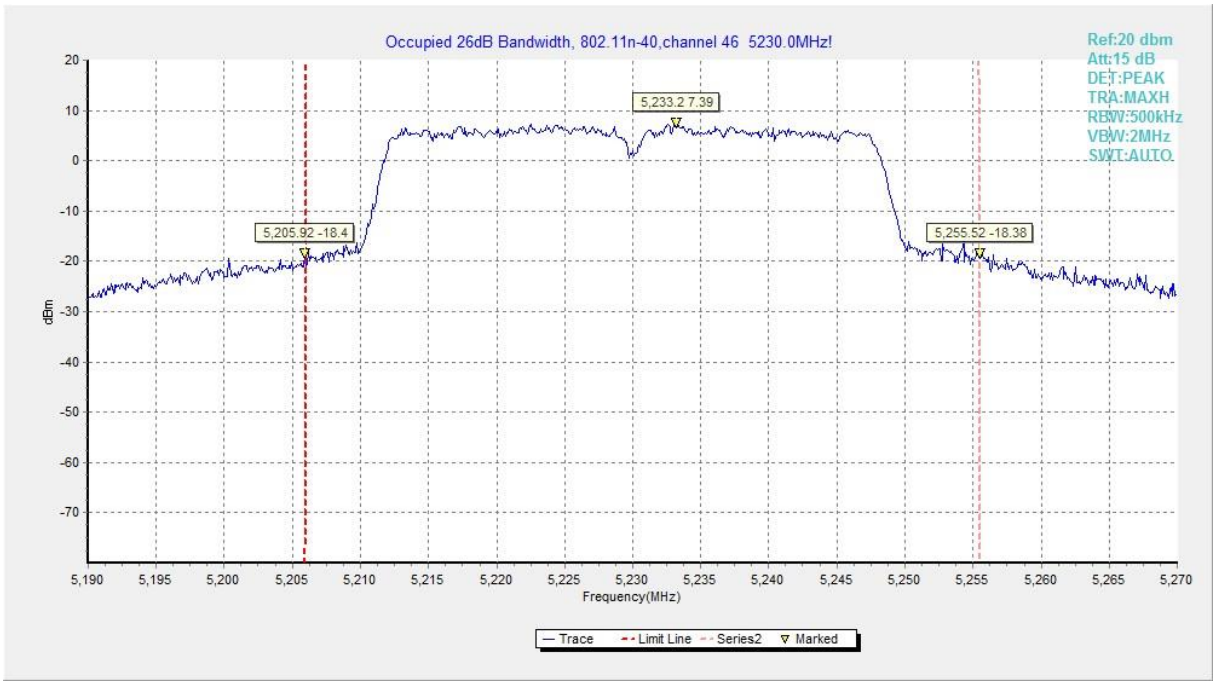

Fig.22 Occupied 26dB Bandwidth (802.11n-HT40, 5230MHz)

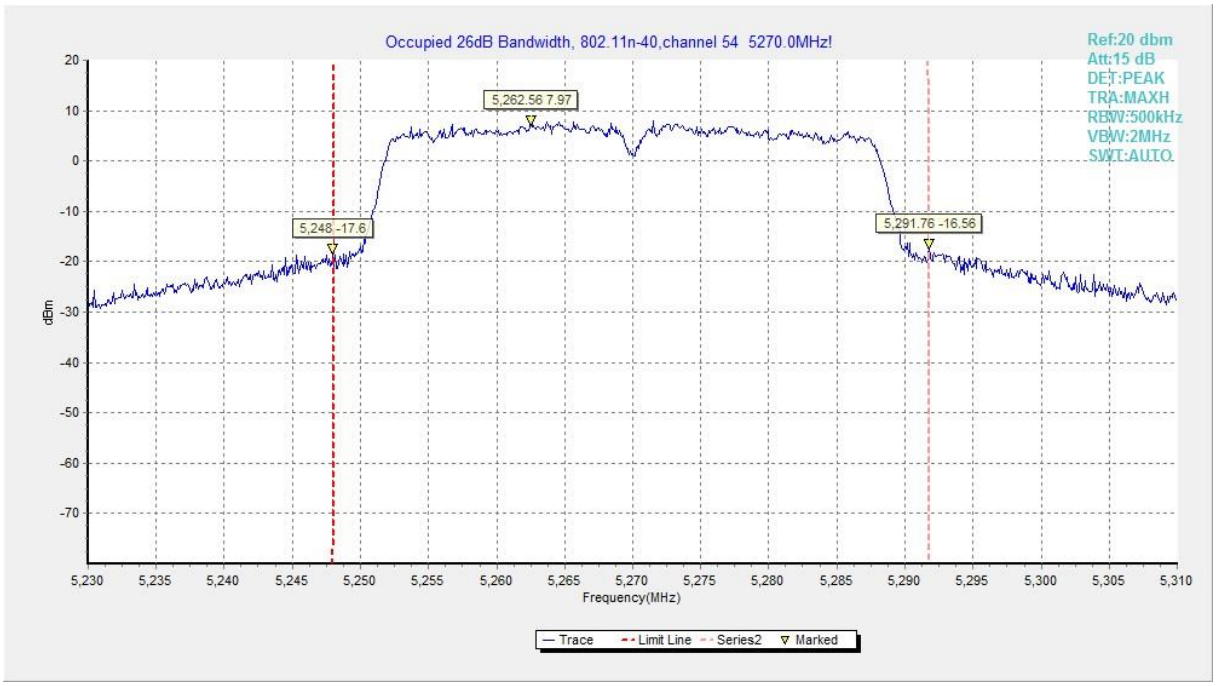

Fig.23 Occupied 26dB Bandwidth (802.11n-HT40, 5270MHz)

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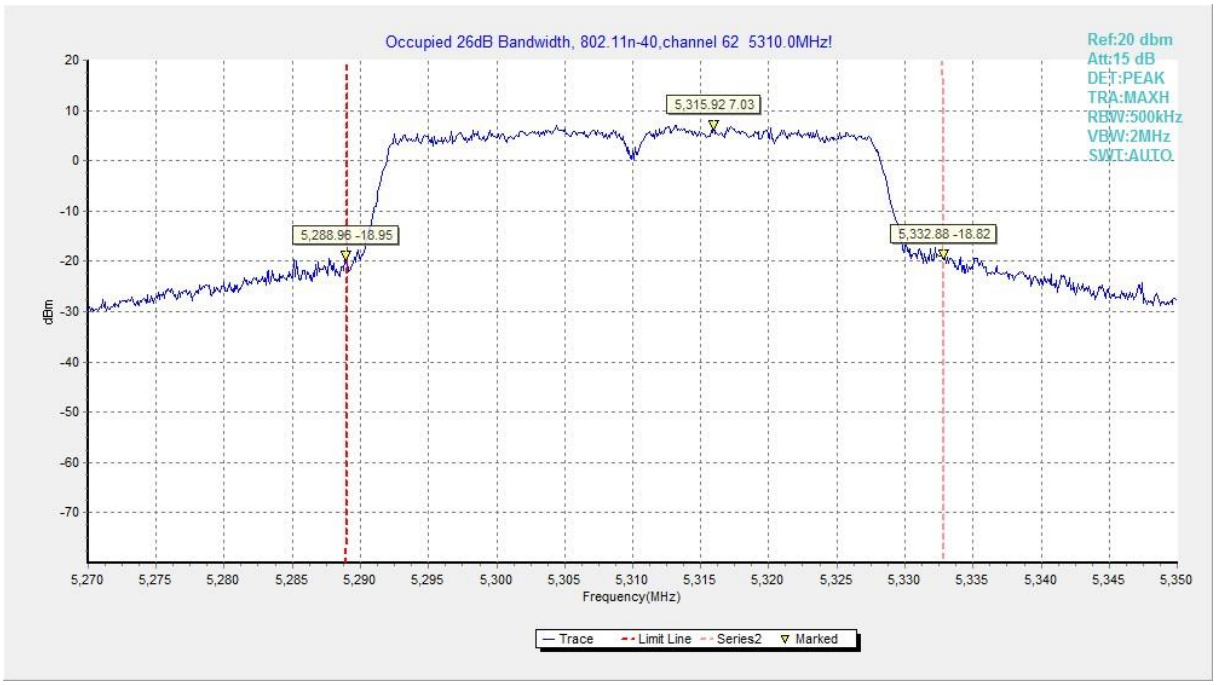

Fig.24 Occupied 26dB Bandwidth (802.11n-HT40, 5310MHz)

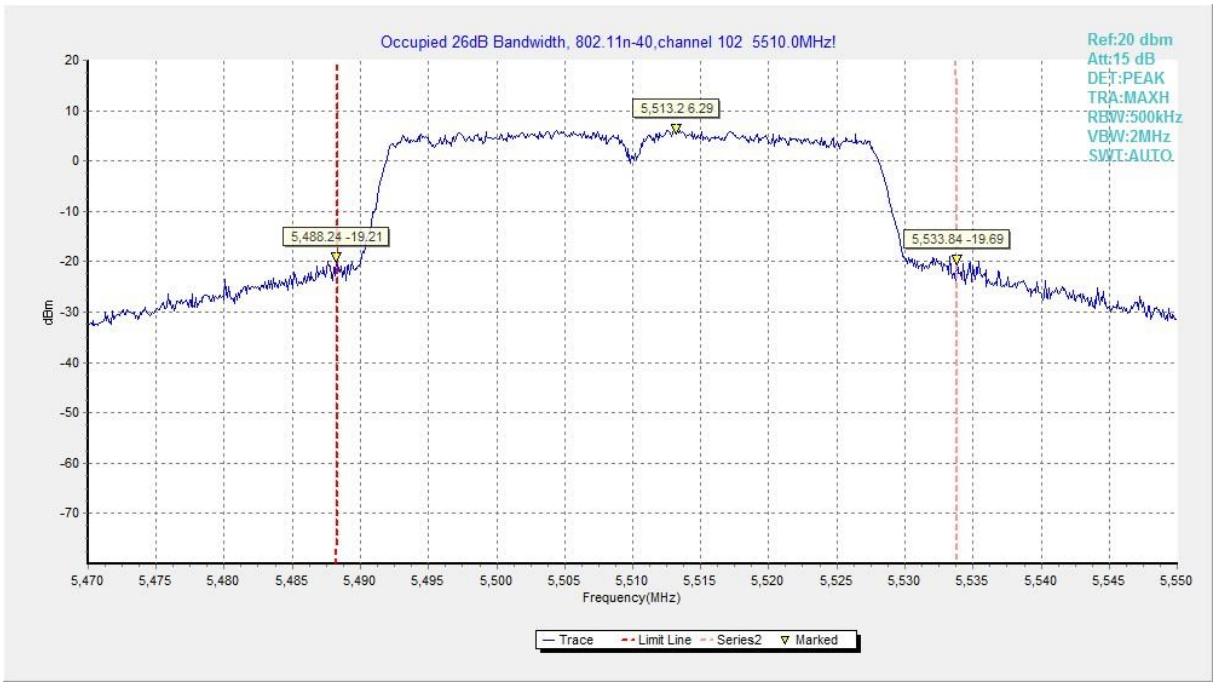

Fig.25 Occupied 26dB Bandwidth (802. 11n-HT40, 5510MHz)

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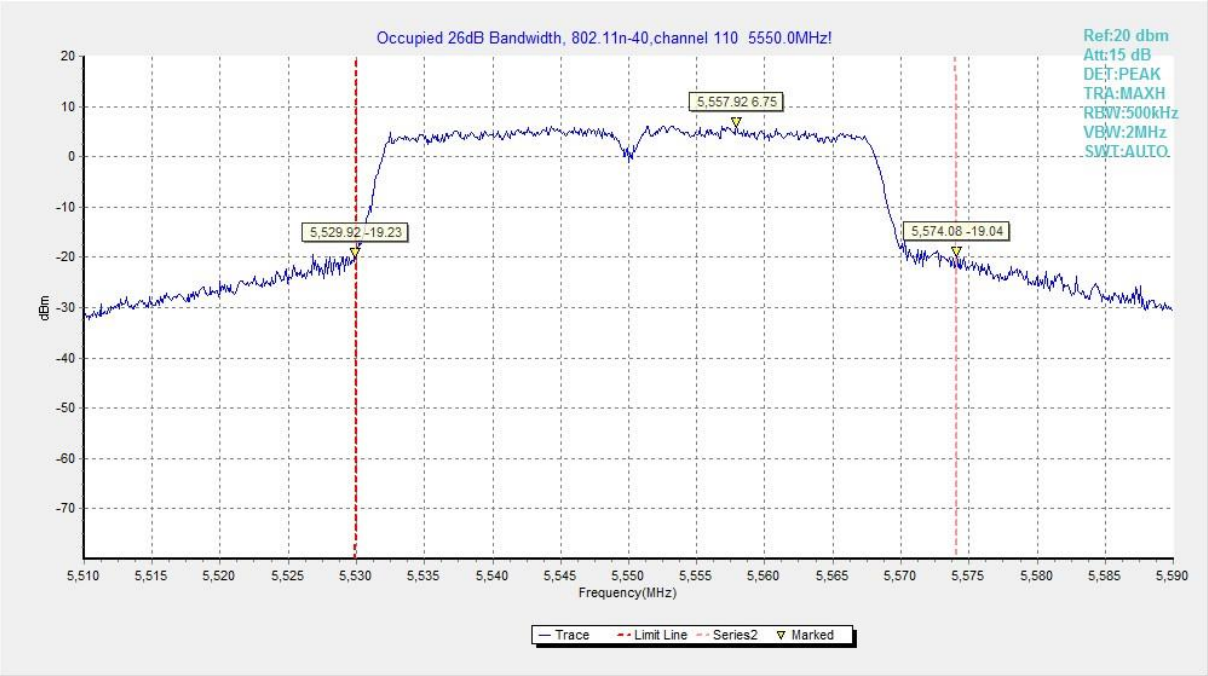

Fig.26 Occupied 26dB Bandwidth (802. 11n-HT40, 5590MHz)

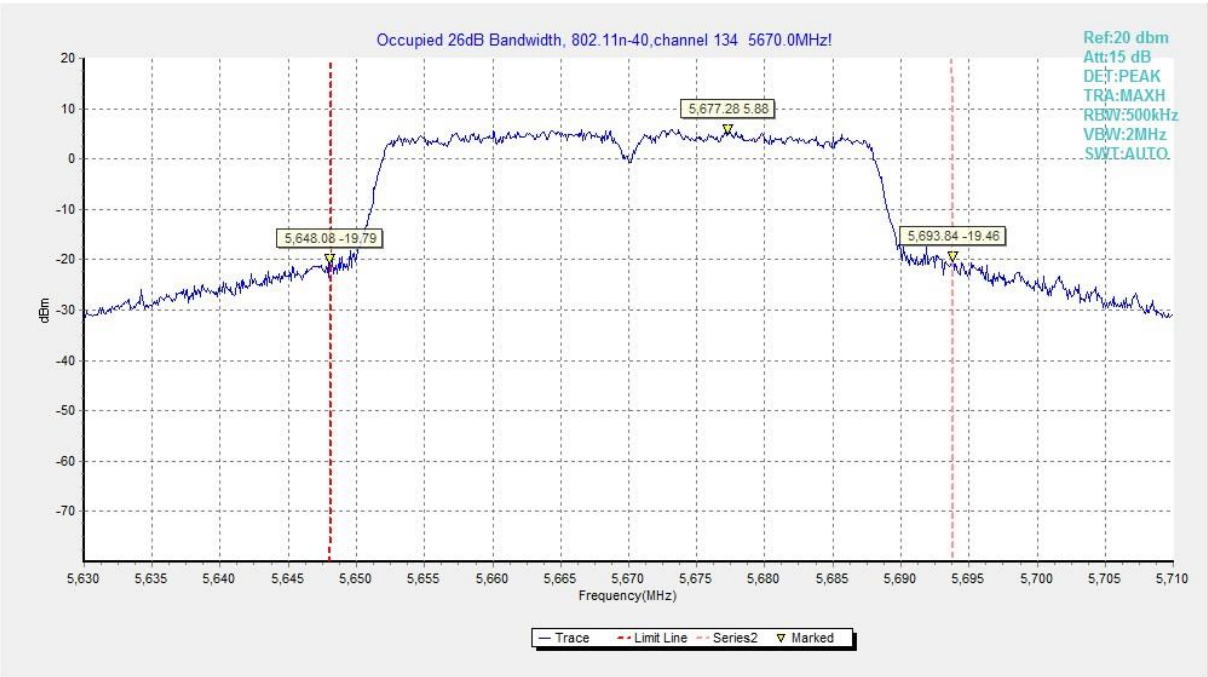

Fig.27 Occupied 26dB Bandwidth (802. 11n-HT40, 5670MHz)

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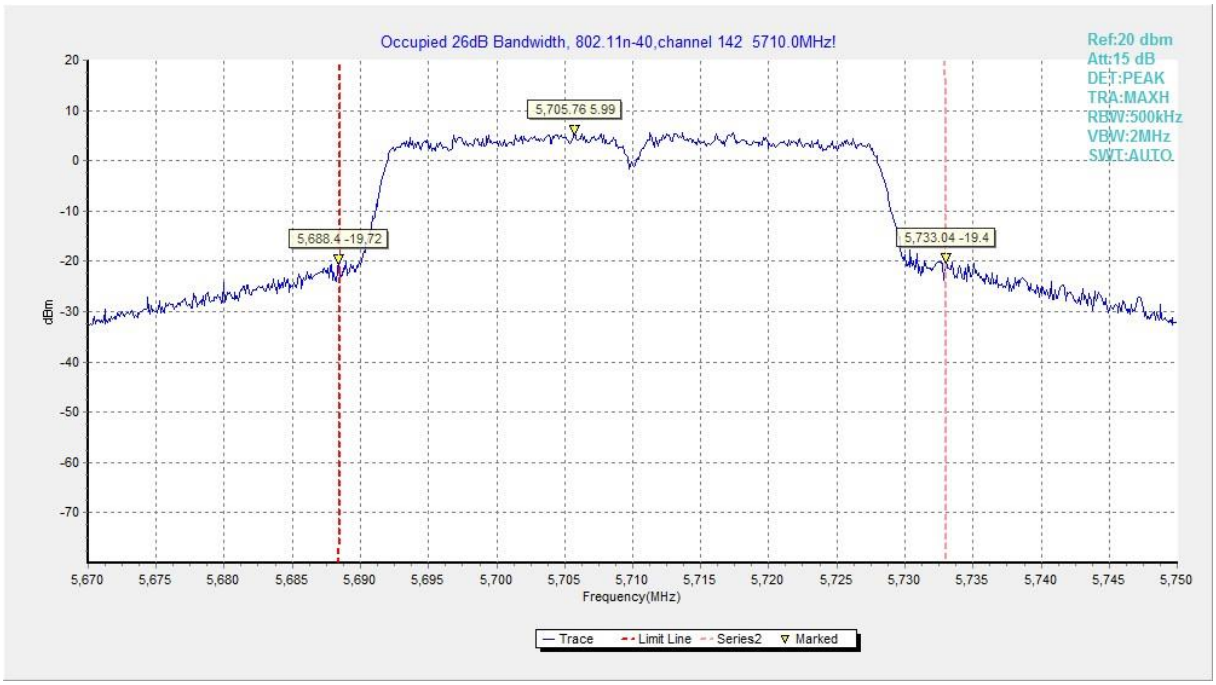

Fig.28 Occupied 26dB Bandwidth (802. 11n-HT40, 5710MHz)

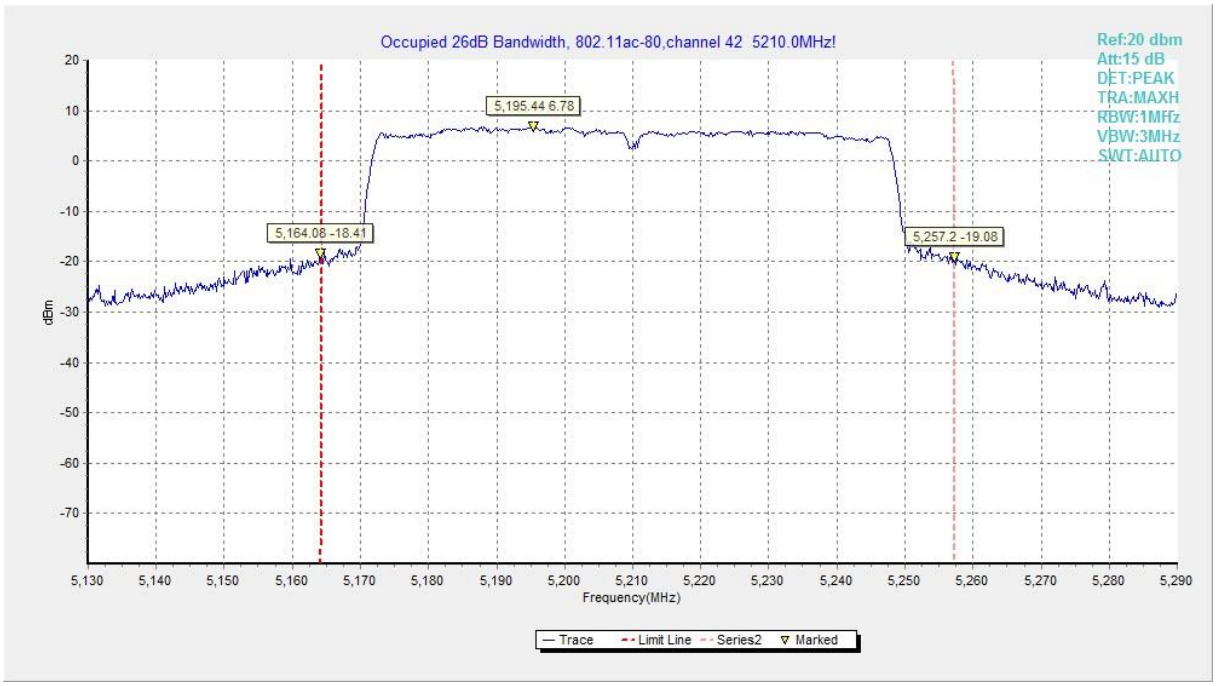

Fig.29 Occupied 26dB Bandwidth (802. 11ac-HT80, 5210MHz)

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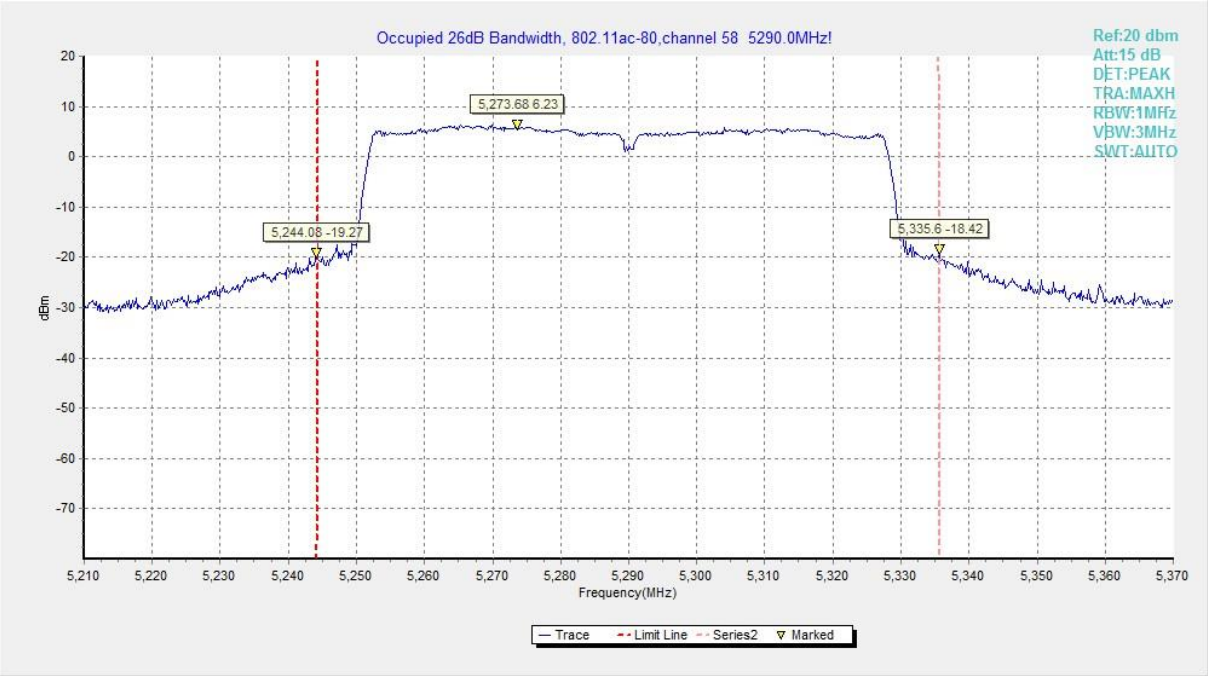

Fig.30 Occupied 26dB Bandwidth (802. 11ac-HT80, 5290MHz)

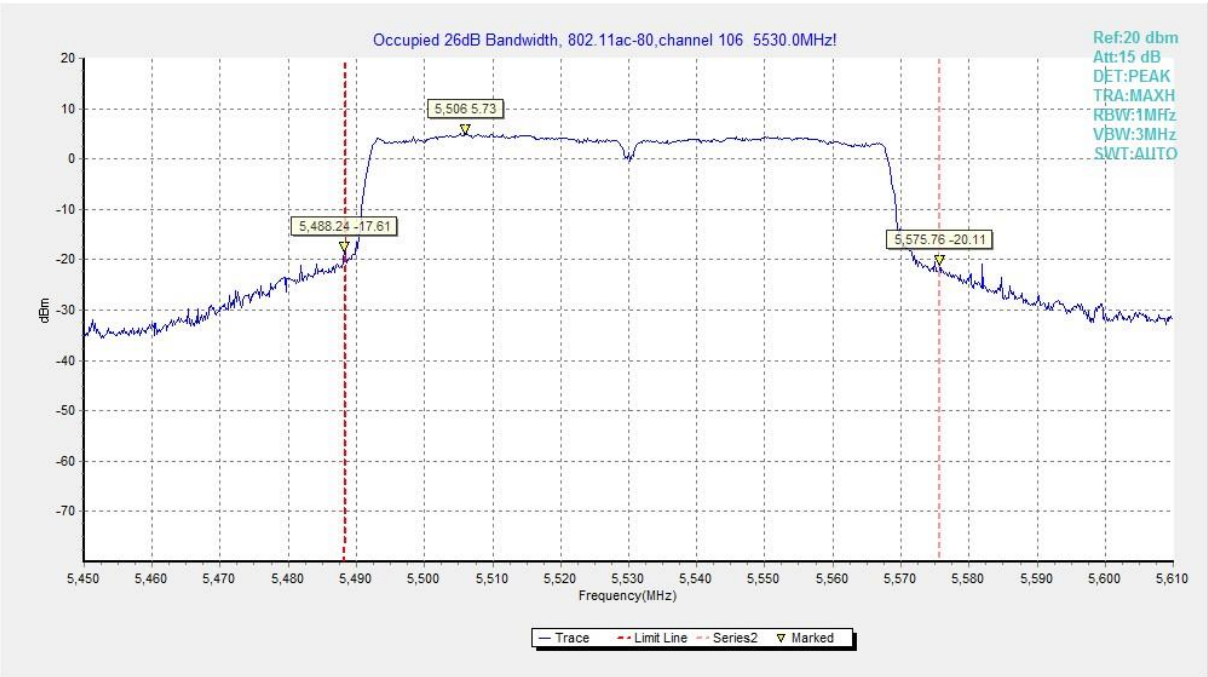

Fig.31 Occupied 26dB Bandwidth (802. 11ac-HT80, 5530MHz)

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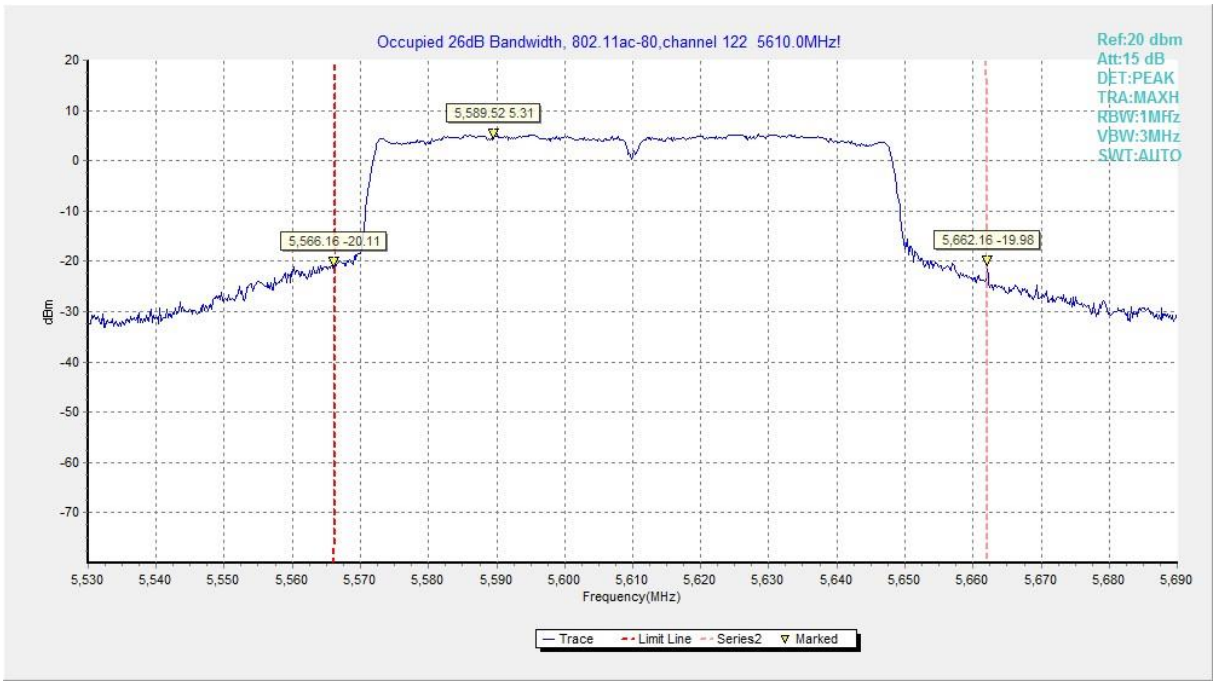

Fig.32 Occupied 26dB Bandwidth (802. 11ac-HT80, 5610MHz)

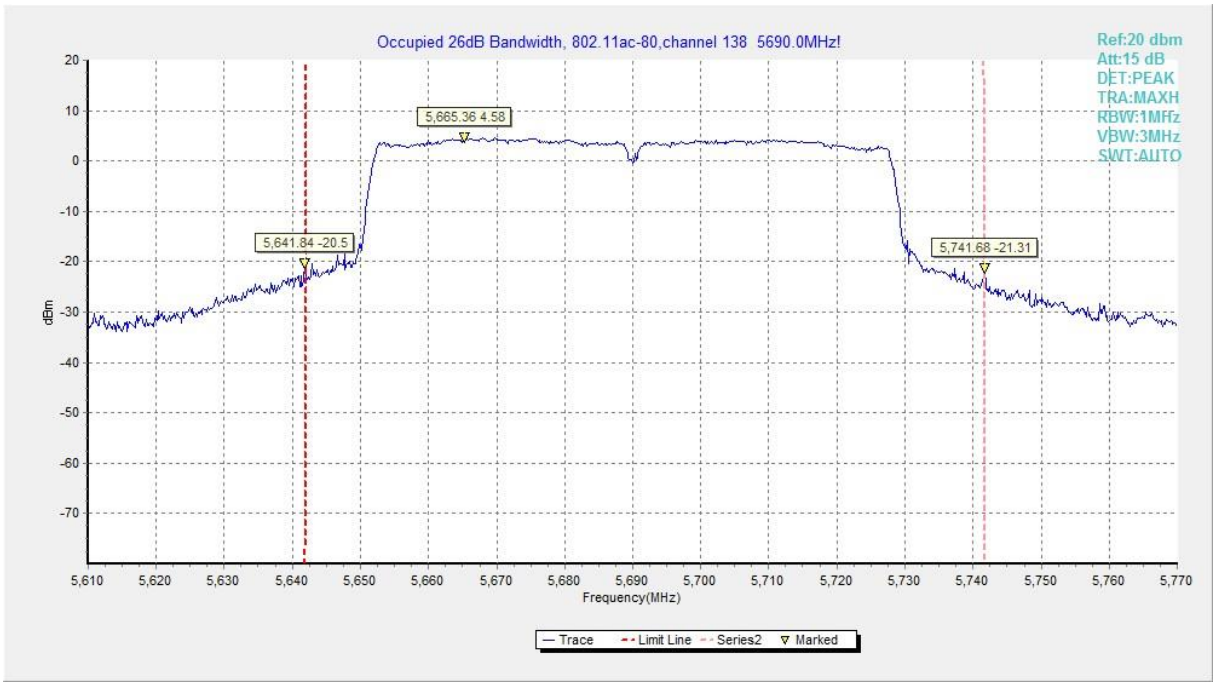

Fig.33 Occupied 26dB Bandwidth (802. 11ac-HT80, 5690MHz)

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A.5. Band Edges Compliance

A5.1 Band Edges - Radiated

Measurement Limit:

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

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(uV/m)	Field strength(dBuV/m)	Measurement distance(m)
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

The measurement is made according to ANSI C63.10-2013 and KDB 789033

Set up:

Tabletop devices shall be placed on a nonconducting platform with nominal top surface dimensions 1 m by 1.5 m and the table height shall be 1.5 m.

The EUT and transmitting antenna shall be centered on the turntable.

Test Procedure

The EUT was placed on a non-conductive table. The measurement antenna was placed at a distance of 3 meters from the EUT. 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. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.

The receiver references:

Frequency of emission (MHz)	RBW/VBW	Sweep Time(s)
30-1000	100kHz/300kHz	5
1000-4000	1MHz/3MHz	15
4000-18000	1MHz/3MHz	40
18000-26500	1MHz/3MHz	20

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Measurement Result:

Mode	Channel	Test Results	Conclusion
802.11a	5180 MHz	Fig.34	P
	5320 MHz	Fig.35	P
	5500 MHz	Fig.36	P
	5700 MHz	Fig.37	P
802.11n HT20	5180 MHz	Fig.38	P
	5320 MHz	Fig.39	P
	5500 MHz	Fig.40	P
	5700 MHz	Fig.41	P
802.11n HT40	5190 MHz	Fig.42	P
	5310 MHz	Fig.43	P
	5510 MHz	Fig.44	P
	5670 MHz	Fig.45	P
802.11ac HT20	5180 MHz	Fig.46	P
	5320 MHz	Fig.47	P
	5500 MHz	Fig.48	P
	5700 MHz	Fig.49	P
802.11ac HT40	5190 MHz	Fig.50	P
	5310 MHz	Fig.51	P
	5510 MHz	Fig.52	P
	5670 MHz	Fig.53	P
802.11ac HT80	5210MHz	Fig.54	P
	5290MHz	Fig.55	P
	5530MHz	Fig.56	P
	5610MHz	Fig.57	P

Conclusion: PASS

Test graphs as below:

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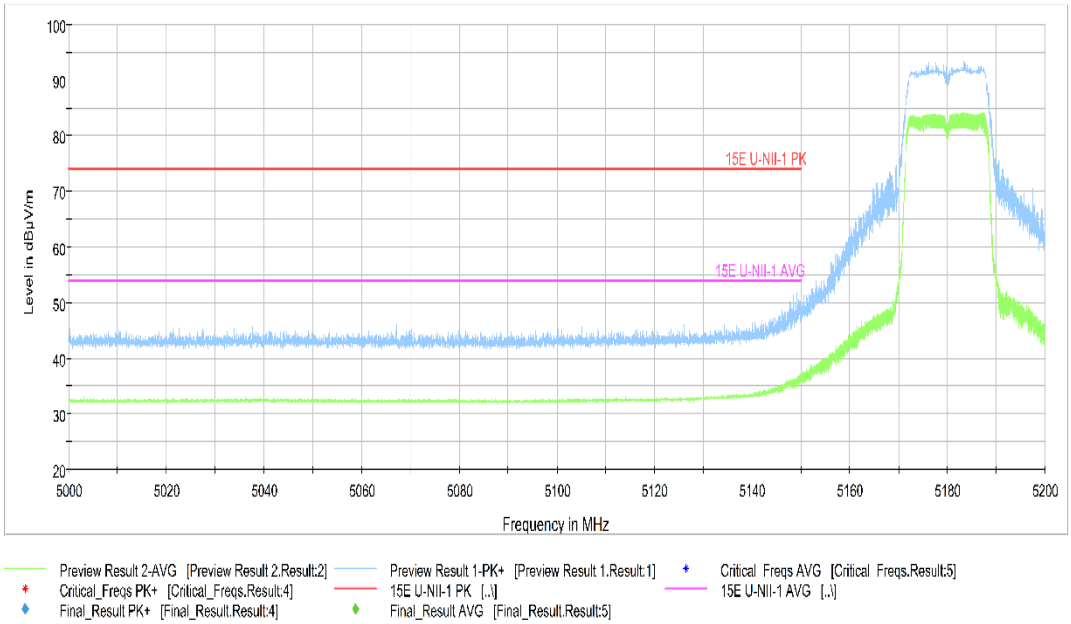

Fig.34 Band Edges (802.11a Ch36, 5180MHz)

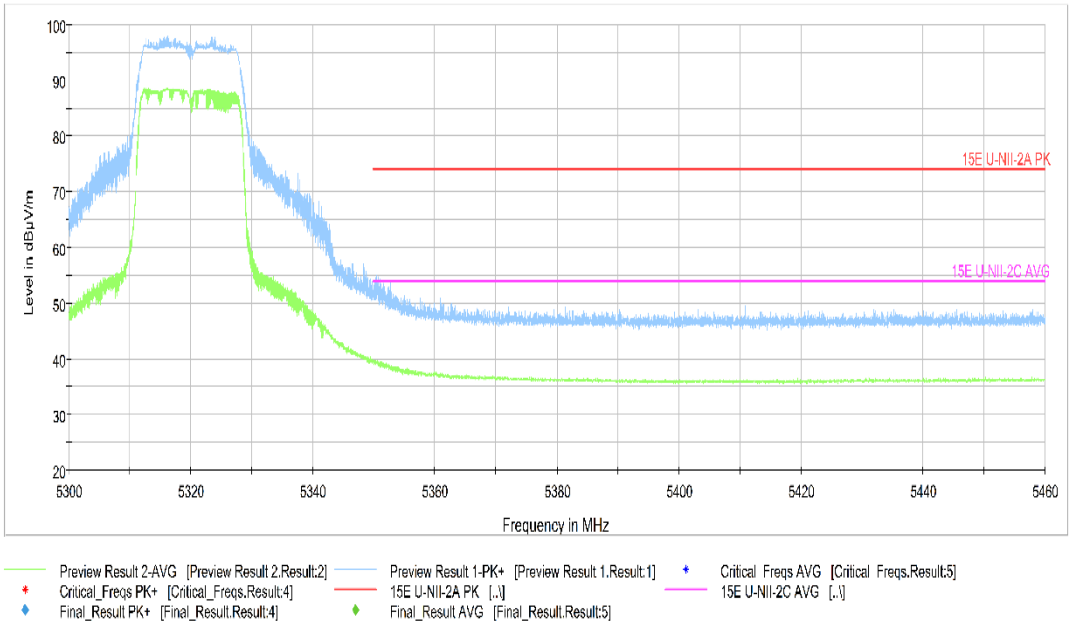

Fig.35 Band Edges (802.11a Ch64, 5320MHz)

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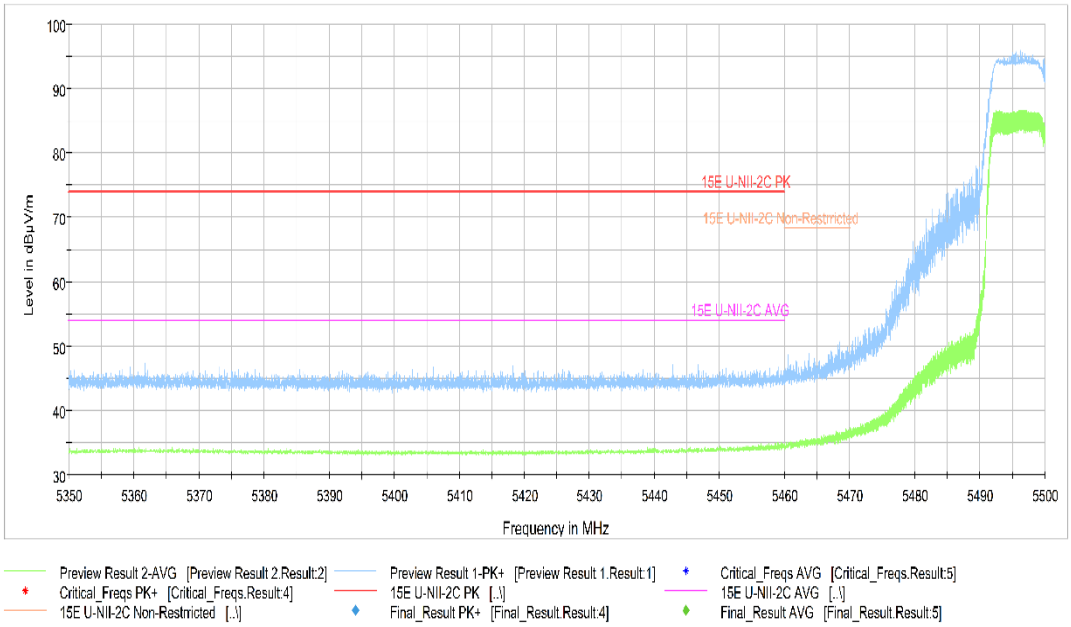

Fig.36 Band Edges (802.11a Ch100, 5500MHz)

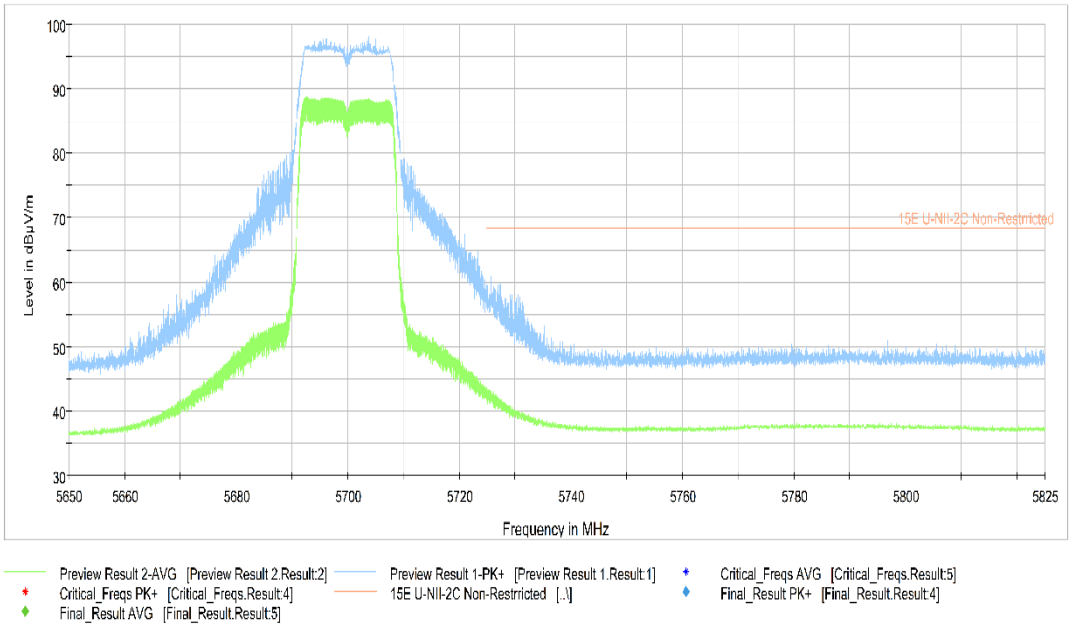

Fig.37 Band Edges (802.11a Ch140, 5700MHz)

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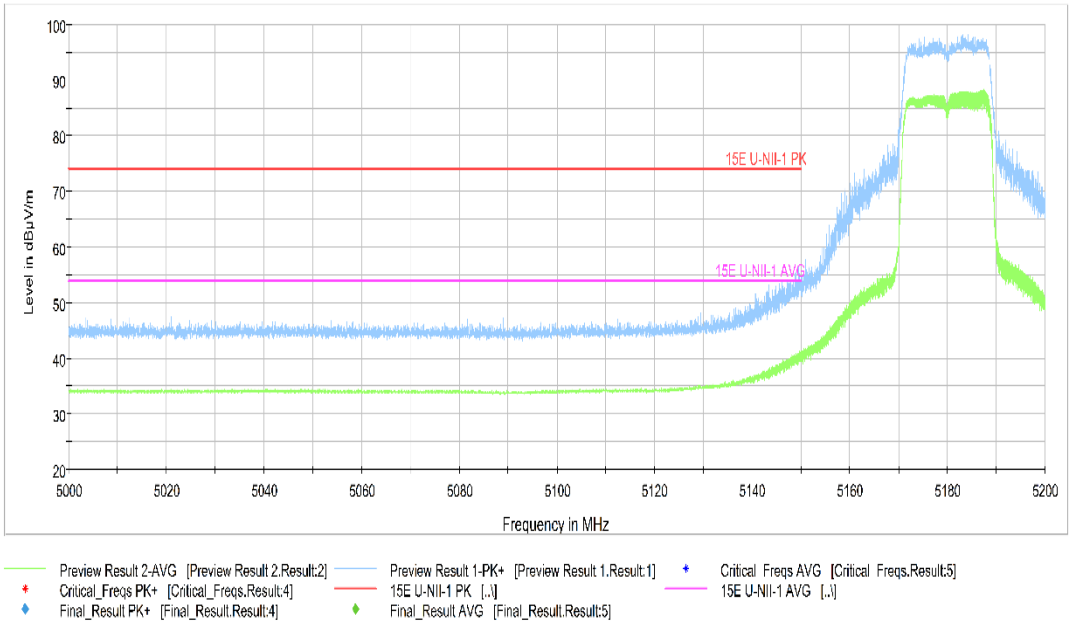

Fig.38 Band Edges (802.11n-HT20 Ch36, 5180MHz)

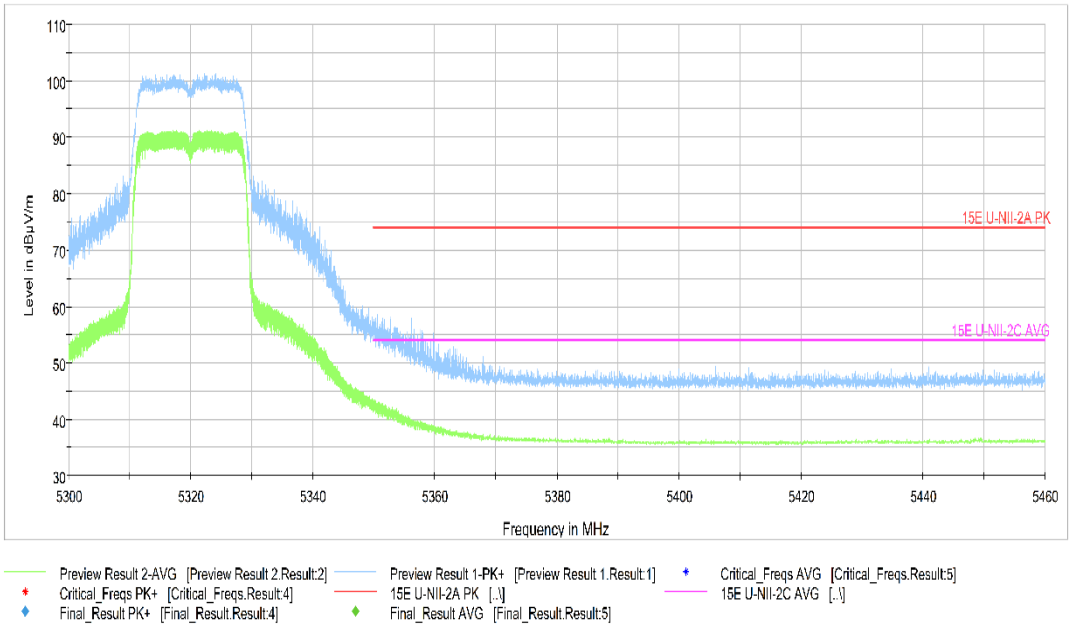

Fig.39 Band Edges (802.11n-HT20 Ch64, 5320MHz)

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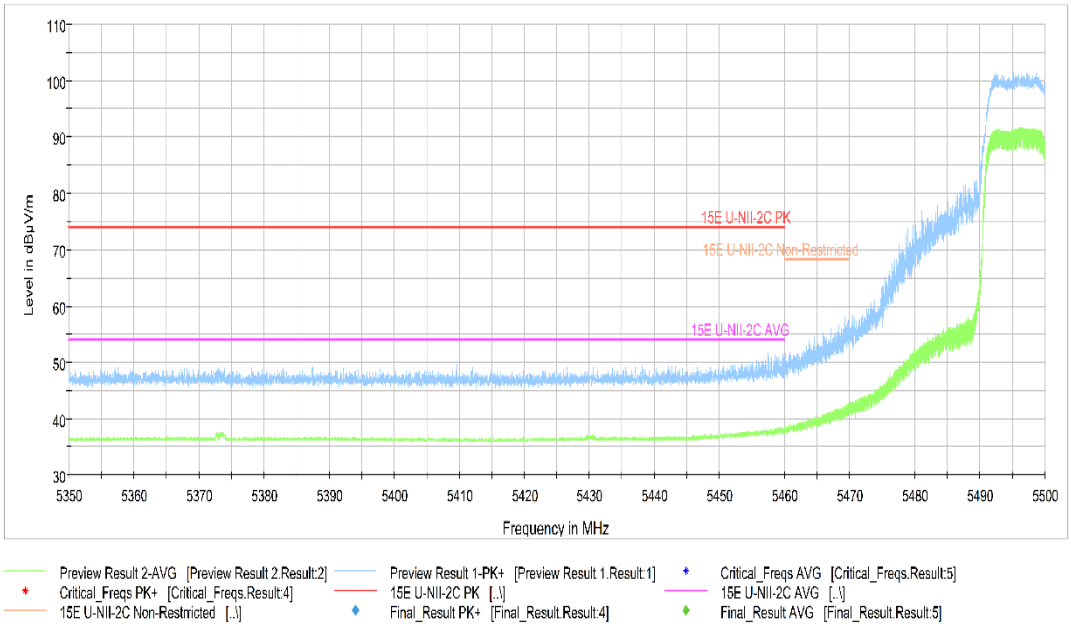

Fig.40 Band Edges (802.11n-HT20 Ch100, 5500MHz)

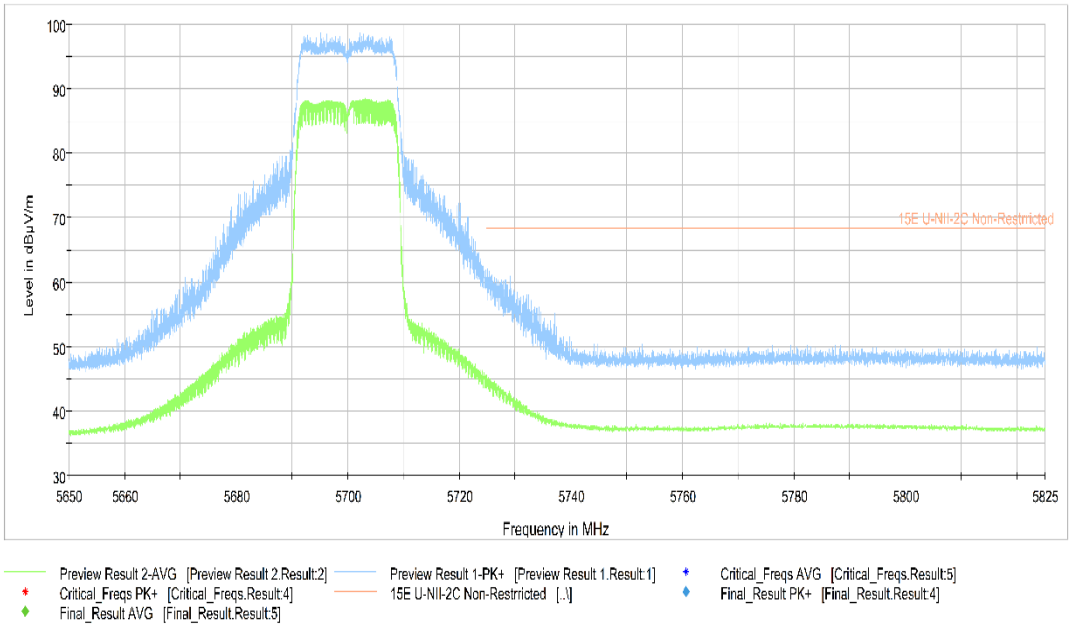

Fig.41 Band Edges (802.11n-HT20 Ch140, 5700MHz)

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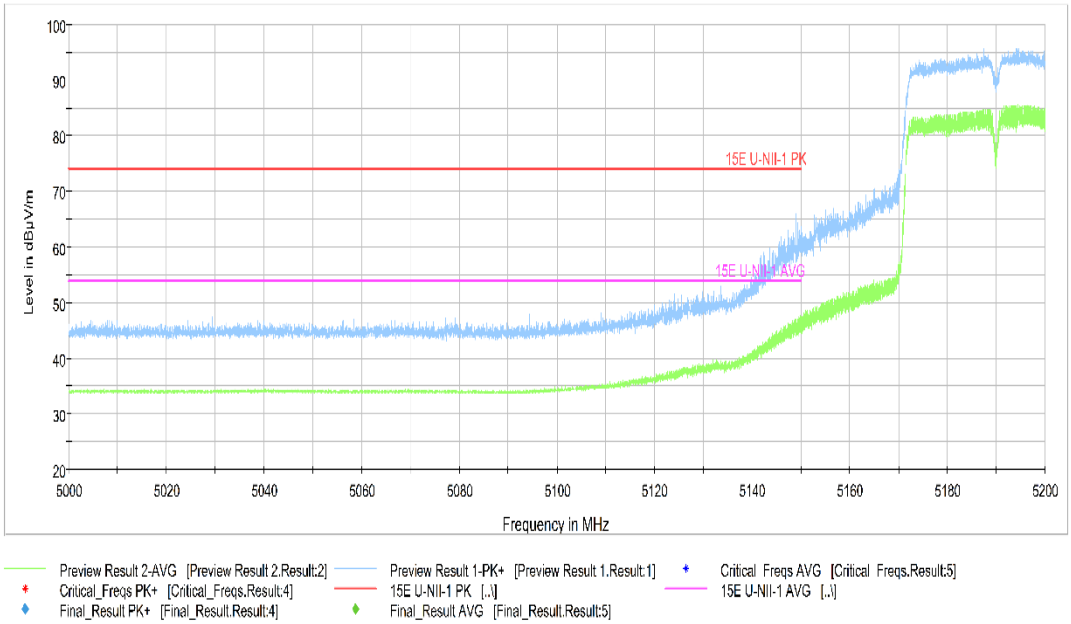

Fig.42 Band Edges (802.11n-HT40 Ch38, 5190MHz)

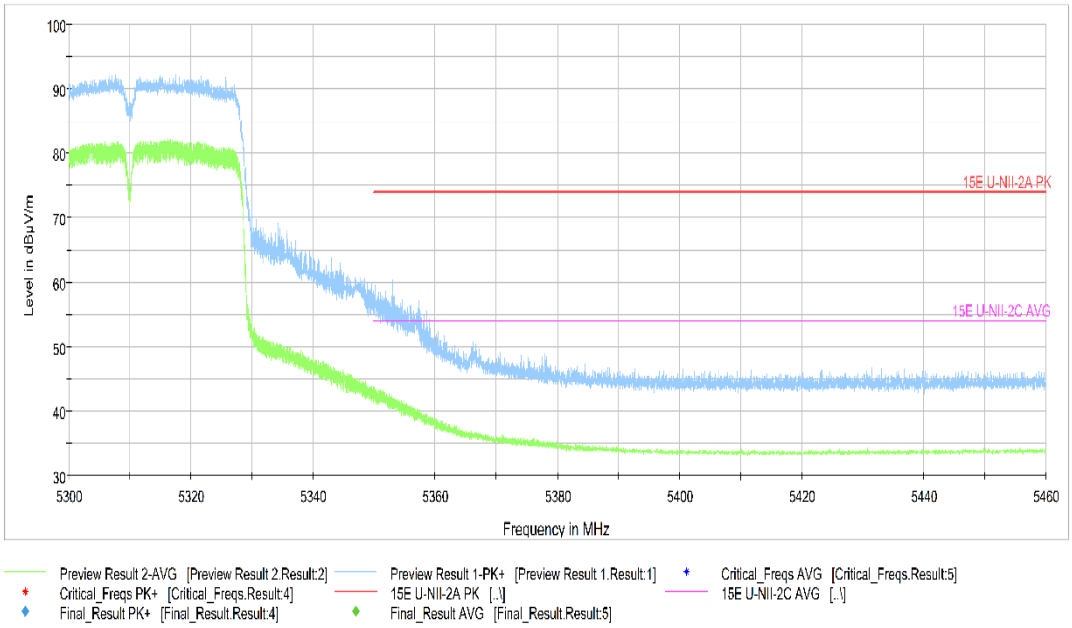

Fig.43 Band Edges (802.11n-HT40 Ch62, 5310MHz)

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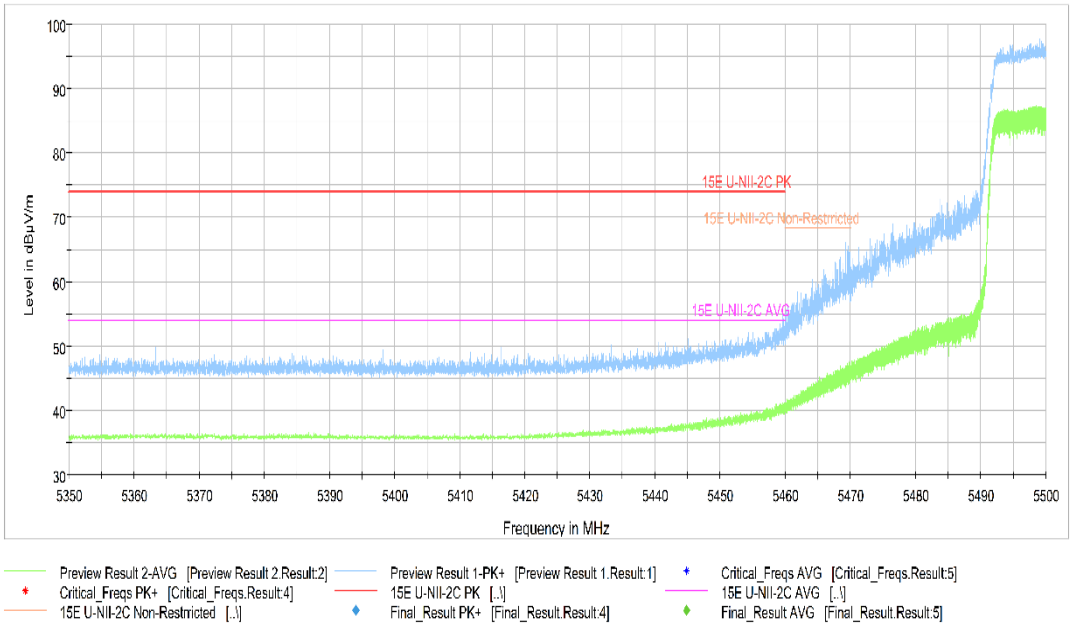

Fig.44 Band Edges (802.11n-HT40 Ch102, 5510MHz)

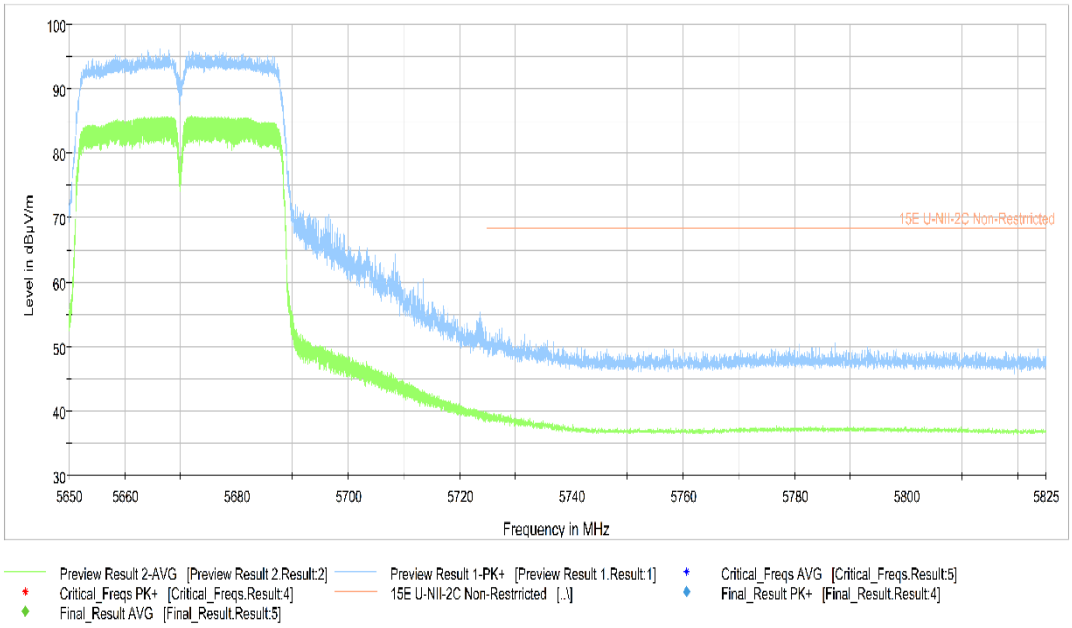

Fig.45 Band Edges (802.11n-HT40 Ch134, 5670MHz)

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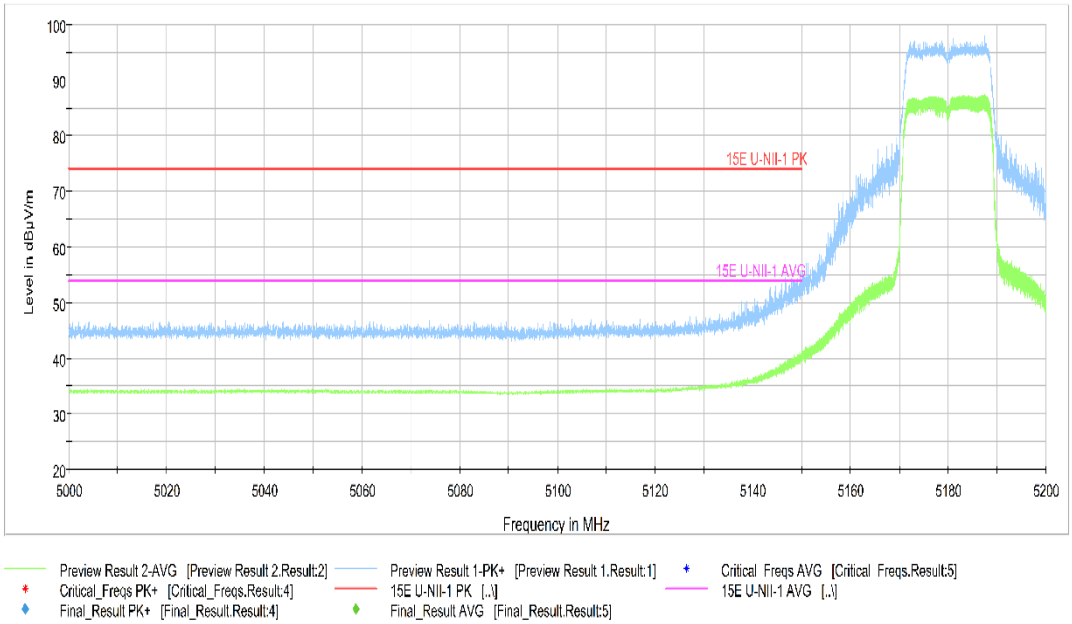

Fig.46 Band Edges (802.11ac-HT20 Ch36, 5180MHz)

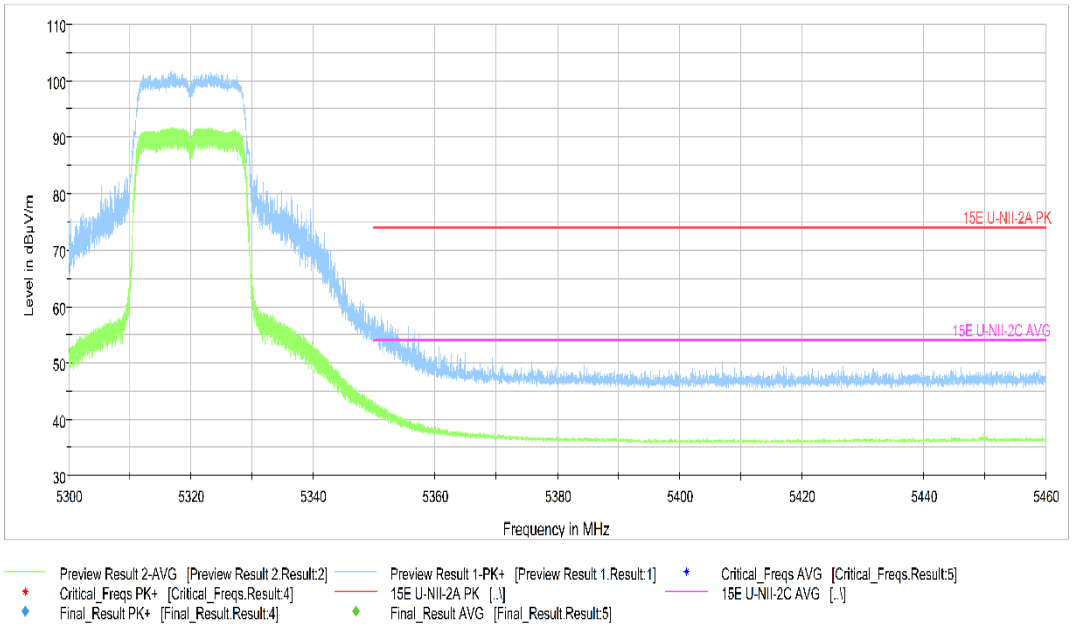

Fig.47 Band Edges (802.11ac-HT20 Ch64, 5320MHz)

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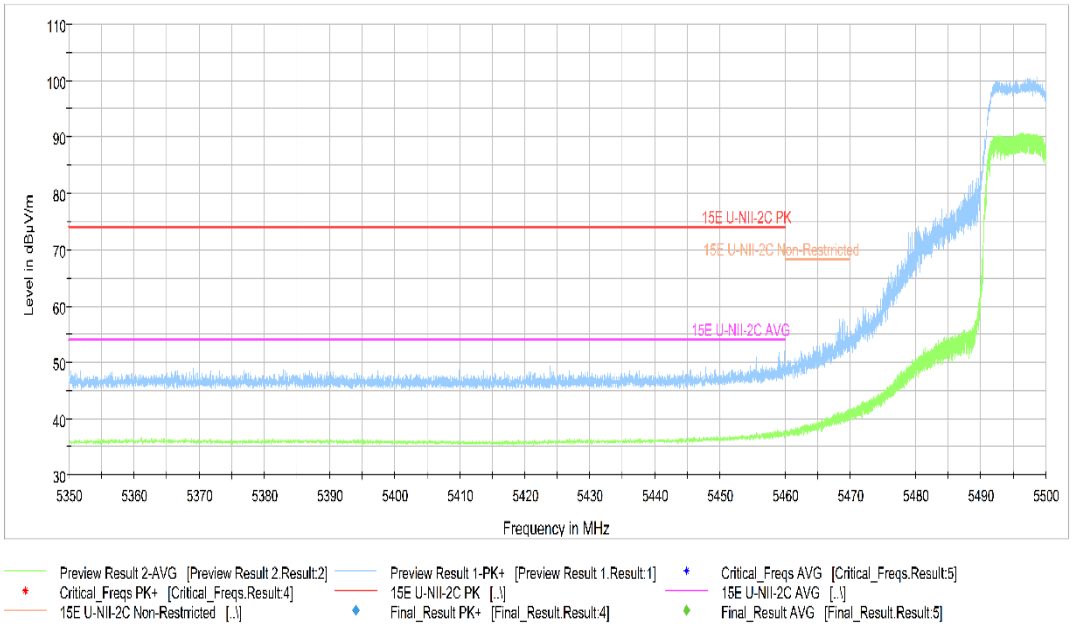

Fig.48 Band Edges (802.11ac-HT20 Ch100, 5500MHz)

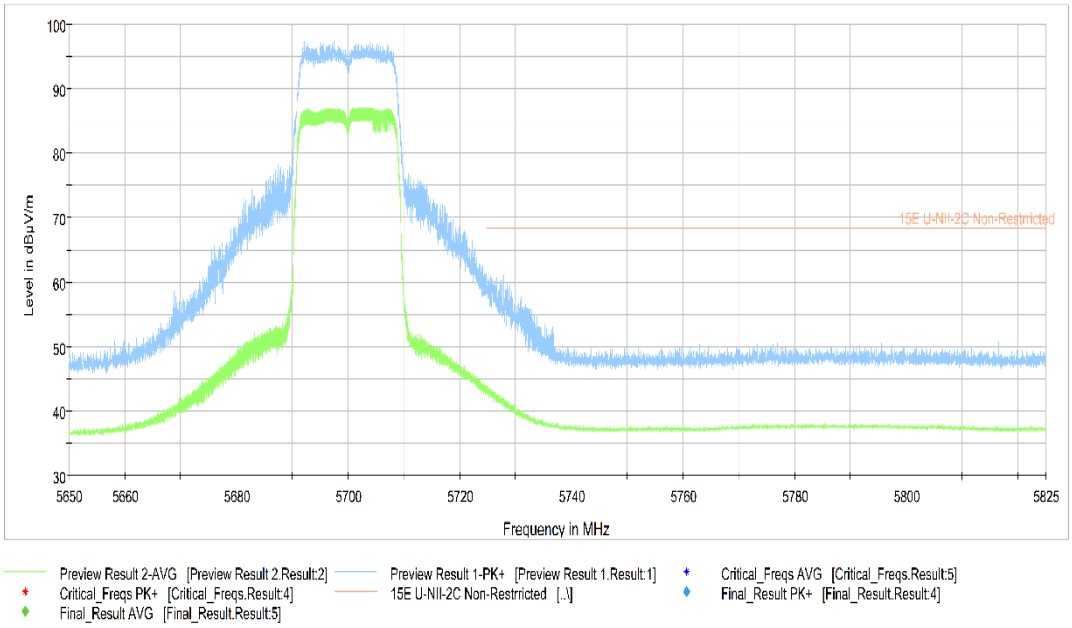

Fig.49 Band Edges (802.11ac-HT20 Ch140, 5700MHz)

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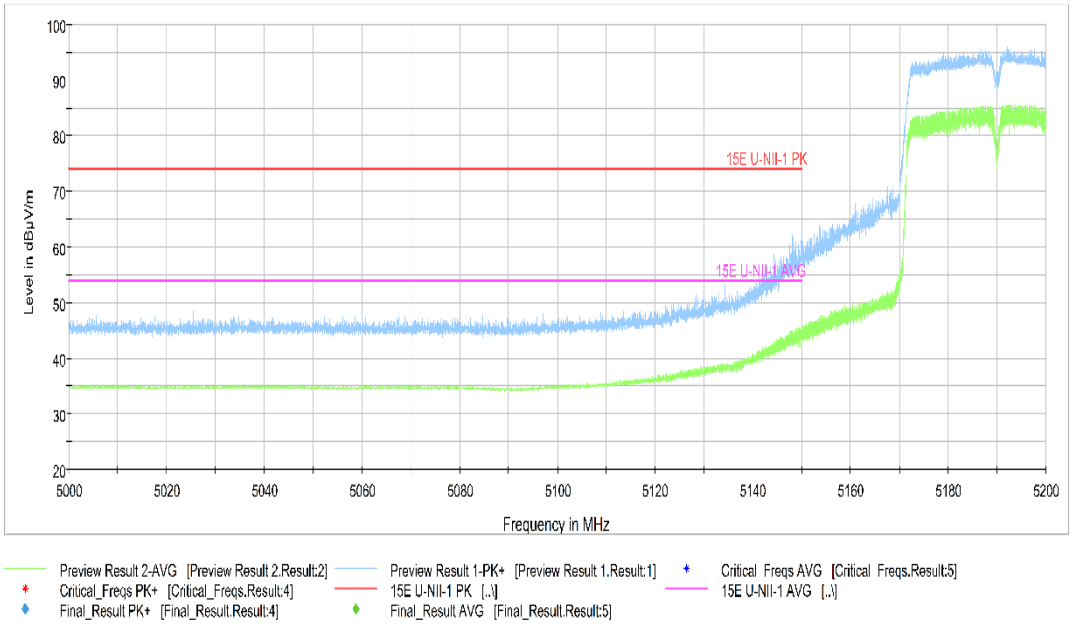

Fig.50 Band Edges (802.11ac-HT40 Ch38, 5190MHz)

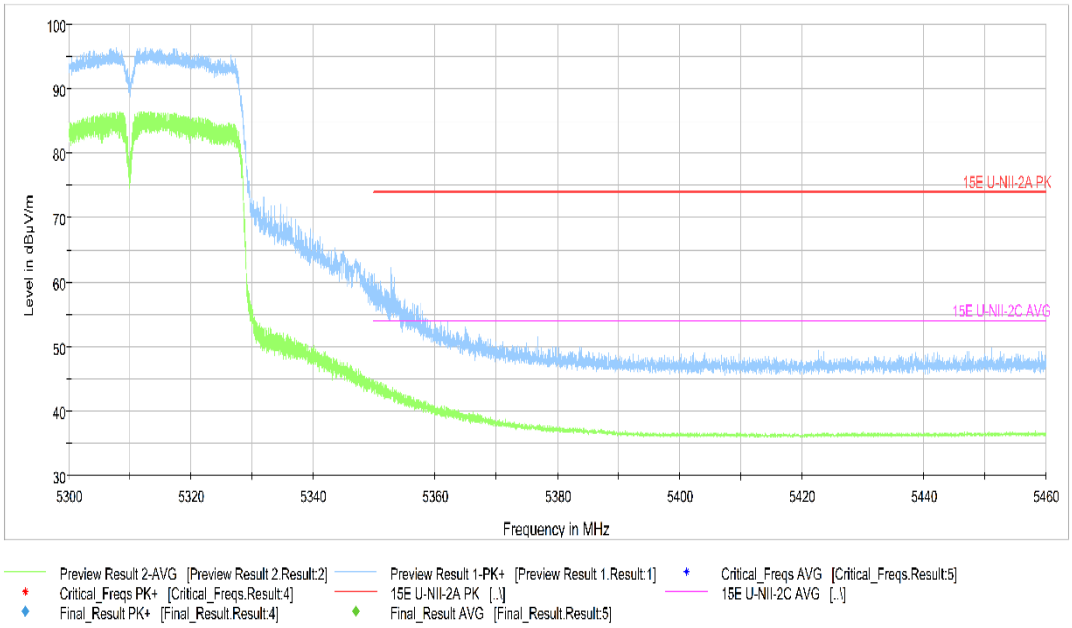

Fig.51 Band Edges (802.11ac-HT40 Ch62, 5310MHz)

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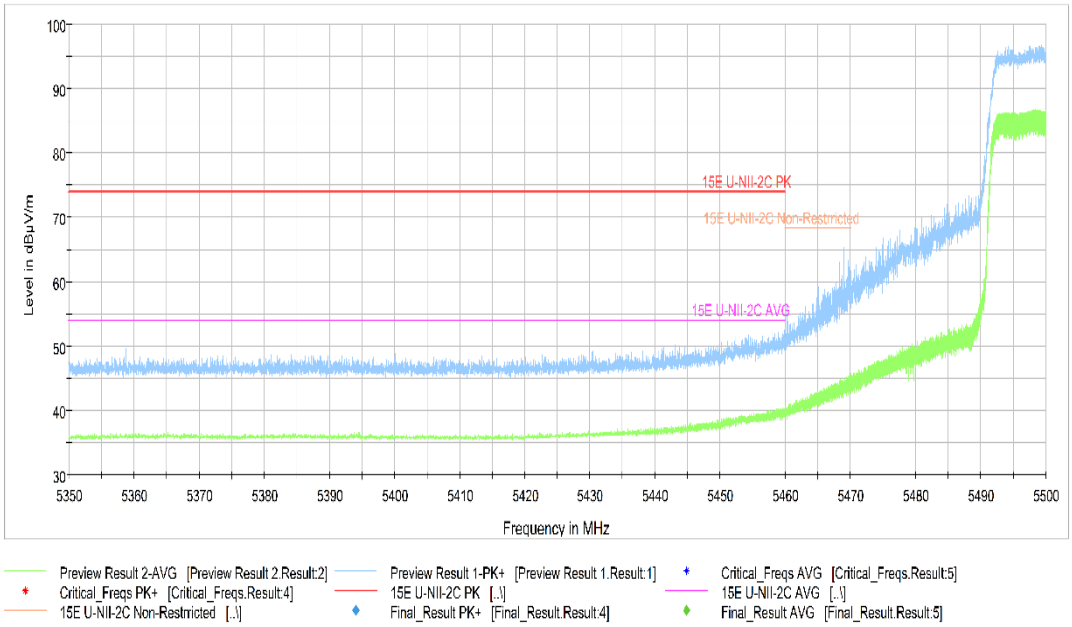

Fig.52 Band Edges (802.11ac-HT40 Ch102, 5510MHz)

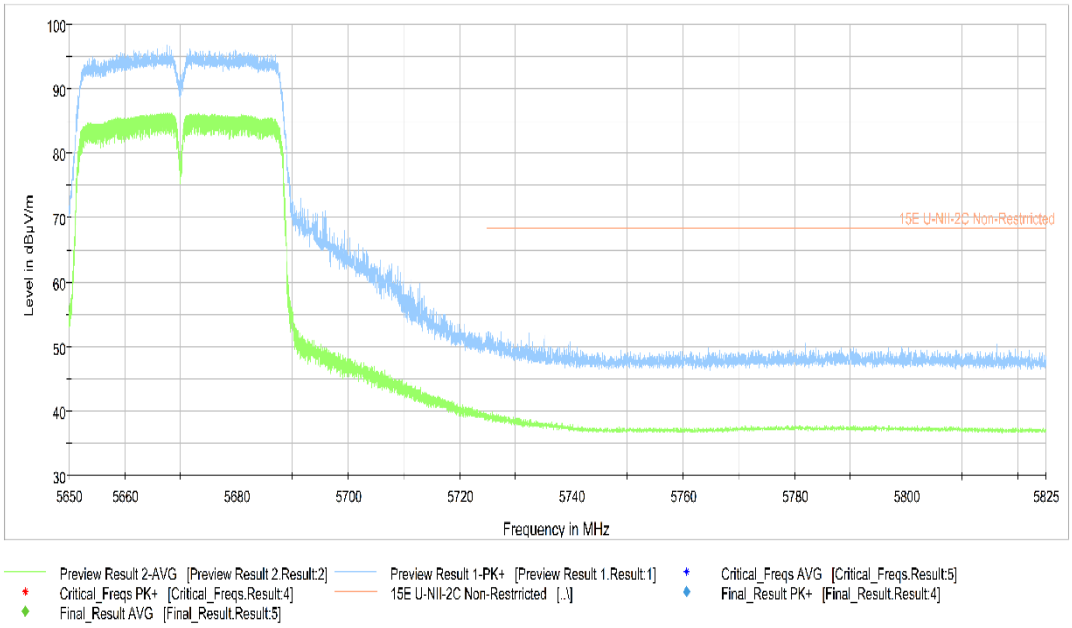

Fig.53 Band Edges (802.11ac-HT40 Ch134, 5670MHz)

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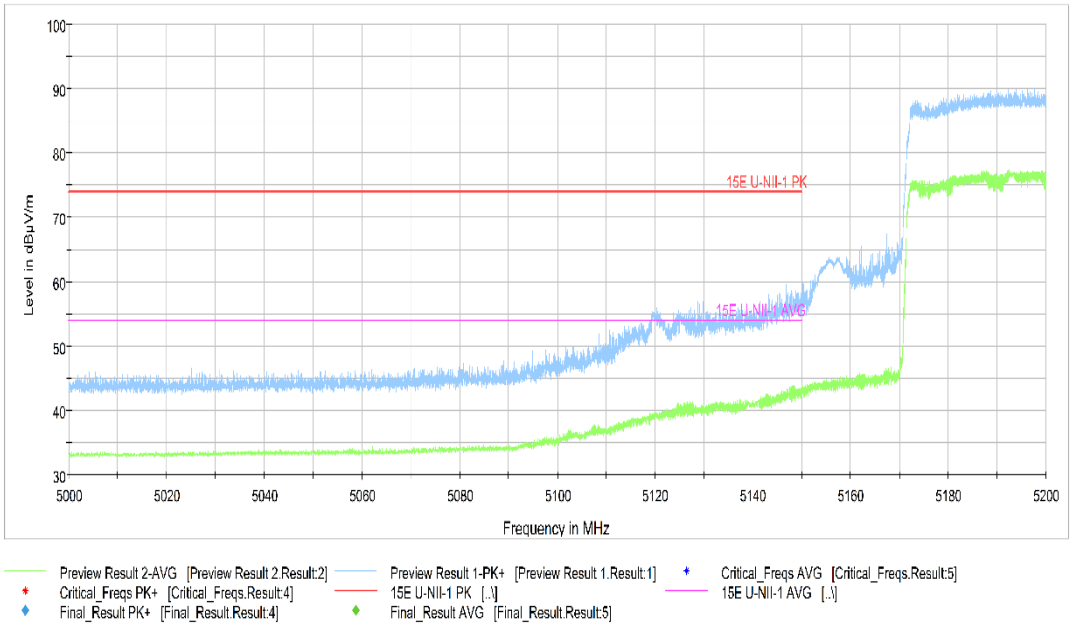

Fig.54 Band Edges (802.11ac-HT80 Ch42 , 5210MHz)

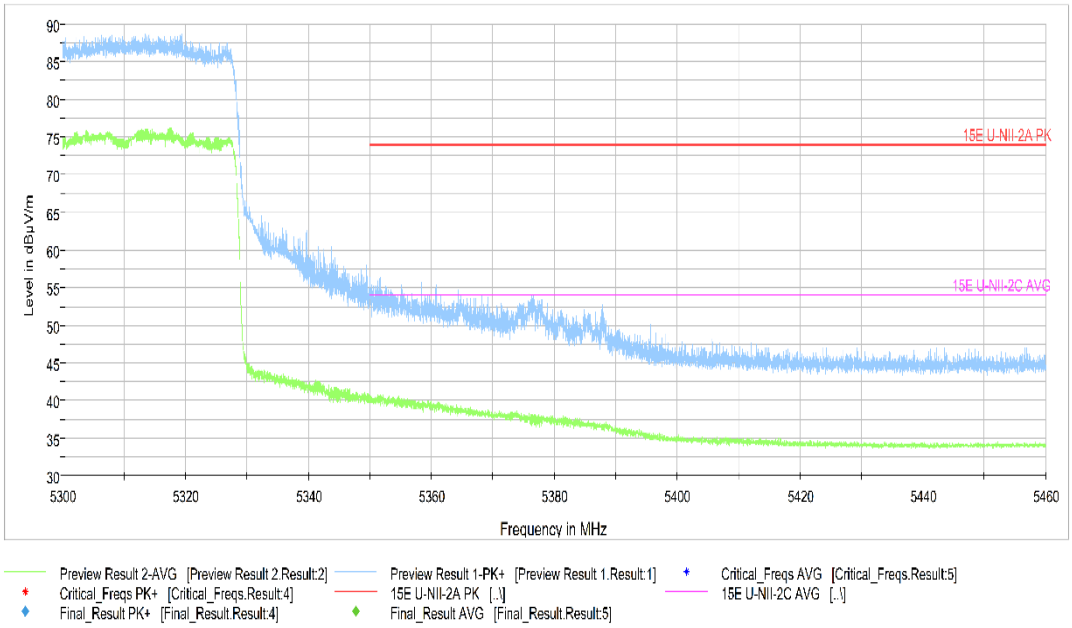

Fig.55 Band Edges (802.11ac-HT80 Ch58, 5290MHz)

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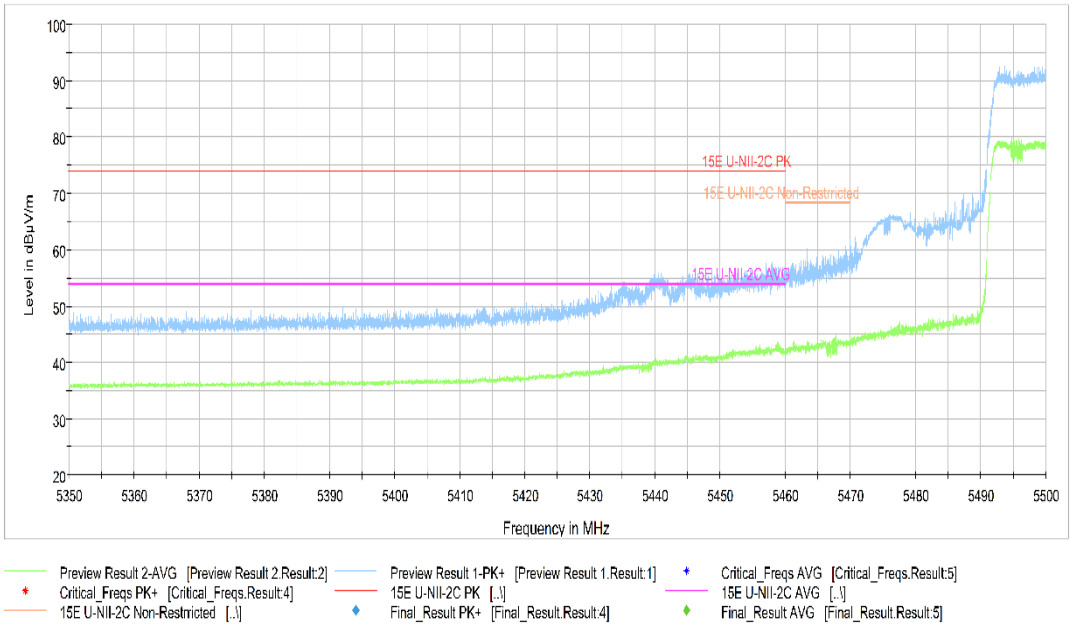

Fig.56 Band Edges (802.11ac-HT80 Ch106, 5530MHz)

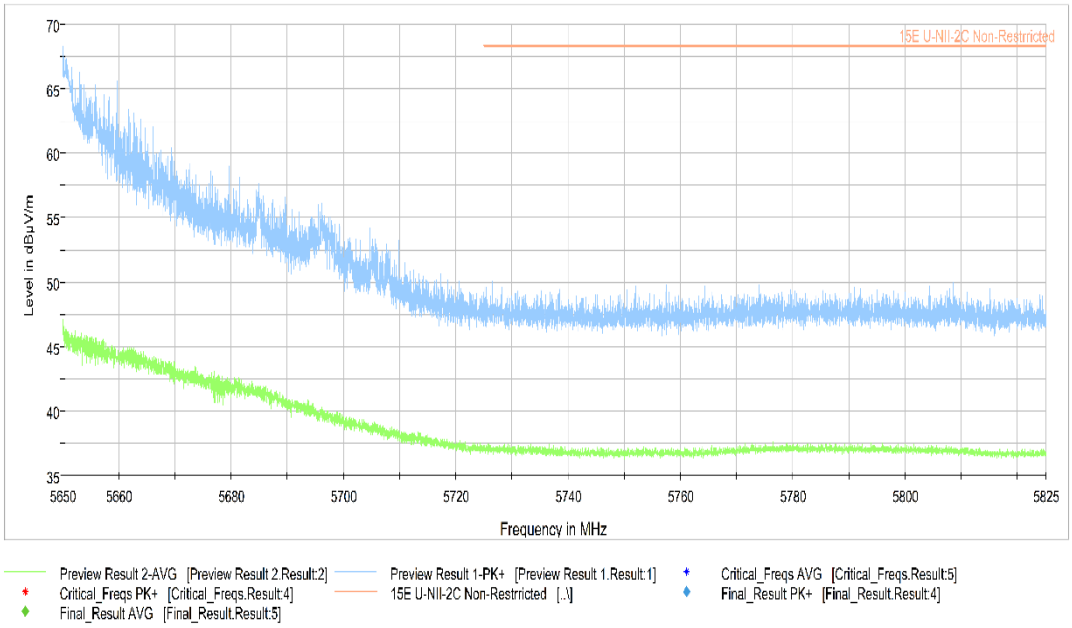

Fig.57 Band Edges (802.11ac-HT80 Ch122, 5610MHz)

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A.6. Transmitter Spurious Emission

Measurement Limit:

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

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 (MHz)	Field strength(μV/m)	Measurement distance(m)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30

Frequency of emission (MHz)	Field strength(uV/m)	Field strength(dBuV/m)	Measurement distance(m)
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

The measurement is made according to ANSI C63.10-2013 and KDB 789033

Set up:

Tabletop devices shall be placed on a nonconducting platform with nominal top surface dimensions 1 m by 1.5 m. For emissions testing at or below 1 GHz, the table height shall be 80 cm above the reference ground plane. For emission measurements above 1 GHz, the table height shall be 1.5 m

The EUT and transmitting antenna shall be centered on the turntable.

Test Procedure

The EUT was placed on a non-conductive table. The measurement antenna was placed at a distance of 3 meters from the EUT. 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. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.

The receiver references:

Frequency of emission (MHz)	RBW/VBW	Sweep Time(s)
30-1000	100kHz/300kHz	5
1000-4000	1MHz/3MHz	15
4000-18000	1MHz/3MHz	40
18000-26500	1MHz/3MHz	20

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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)	9kHz ~30 MHz	---	P
		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
	52(5260MHz)	1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
		7 GHz ~ 18 GHz	---	P
	56(5280MHz)	9kHz ~30 MHz	---	P
		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
	64(5320MHz)	1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
		7 GHz ~ 18 GHz	---	P
	100(5500MHz)	1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
		7 GHz ~ 18 GHz	---	P
	120(5600MHz)	9kHz ~30 MHz	---	P
		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
	140(5700MHz)	1 GHz ~ 3 GHz	---	P

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		3 GHz ~ 7 GHz	---	P
		7 GHz ~ 18 GHz	---	P
	144(5720MHz)	1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
		7 GHz ~ 18 GHz	---	P

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
	52(5260MHz)	1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
		7 GHz ~ 18 GHz	---	P
	56(5280MHz)	9kHz ~30 MHz	---	P
		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
	64(5320MHz)	1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
		7 GHz ~ 18 GHz	---	P
	100(5500MHz)	1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
		7 GHz ~ 18 GHz	---	P
	120(5600MHz)	9kHz ~30 MHz	---	P
		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

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		26.5 GHz ~ 40 GHz	---	P
	140(5700MHz)	1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
		7 GHz ~ 18 GHz	---	P
	144(5720MHz)	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
	54(5270MHz)	9kHz ~30 MHz	---	P
		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
	62(5310MHz)	1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
		7 GHz ~ 18 GHz	---	P
	102(5510MHz)	9kHz ~30 MHz	---	P
		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
	118(5590MHz)	1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
		7 GHz ~ 18 GHz	---	P
	134(5670MHz)	1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
		7 GHz ~ 18 GHz	---	P

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	142(5710MHz)	1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
		7 GHz ~ 18 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
		7 GHz ~ 18 GHz	---	P
	52(5260MHz)	1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
		7 GHz ~ 18 GHz	---	P
	56(5280MHz)	9kHz ~30 MHz	---	P
		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
	64(5320MHz)	1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
		7 GHz ~ 18 GHz	---	P
	100(5500MHz)	1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
		7 GHz ~ 18 GHz	---	P
	120(5600MHz)	9kHz ~30 MHz	---	P
		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

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