FCC PART 15
TEST REPORT
No.I22Z60808-IOT05

for

Razer Inc.

Gaming Tablet

RZ45-0460VWQ

With

FCC ID: RWO-RZ450460

Hardware Version: V4

Software Version: Razer Edge 5G-12-user

Issued Date: 2022-08-26

Note:

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The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S.Government.

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REPORT HISTORY

Report Number	Revision	Description	Issue Date
I22Z60808-IOT05	Rev.0	1st edition	2022-08-03
I22Z60808-IOT05	Rev.1	Add the power result graph. Add the PSD result graph. Update the description of A.1.2.	2022-08-26

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CONTENTS

CONTENTS 3

1. TEST LATORATORY 5

1.1. INTRODUCTION & ACCREDITATION 5
1.2. TESTING LOCATION 5
1.3. TESTING ENVIRONMENT 5
1.4. PROJECT DATE 5
1.5. SIGNATURE 5

2. CLIENT INFORMATION 6

2.1 APPLICANT INFORMATION 6
2.2 MANUFACTURER INFORMATION 6

3. EQUIPMENT UNDER TEST (EUT) AND ANCILLARYEQUIPMENT(AE) 7

3.1. ABOUT EUT 7
3.2. INTERNAL IDENTIFICATION OF EUT USED DURING THE TEST 7
3.3. INTERNAL IDENTIFICATION OF AE USED DURING THE TEST 7
3.4. GENERAL DESCRIPTION 8
3.5. INTERPRETATION OF THE TEST ENVIRONMENT 8

4. REFERENCE DOCUMENTS 8

4.1. DOCUMENTS SUPPLIED BY APPLICANT 8
4.2. REFERENCE DOCUMENTS FOR TESTING 8

5. LABORATORY ENVIRONMENT 8

6. SUMMARY OF TEST RESULTS 9

6.1. SUMMARY OF TEST RESULTS 9
6.2. STATEMENTS 9
6.3. TEST CONDITIONS 9

7. TEST EQUIPMENTS UTILIZED 10

8. MEASUREMENT UNCERTAINTY 11

8.1 TRANSMITTER OUTPUT POWER 11
8.2 PEAK POWER SPECTRAL DENSITY 11
8.3 OCCUPIED CHANNEL BANDWIDTH 11
8.4 BAND EDGES COMPLIANCE 11
8.5 SPURIOUS EMISSIONS 11
8.6. AC POWER-LINE CONDUCTED EMISSION 11

ANNEX A: MEASUREMENT RESULTS 12

A.1. MEASUREMENT METHOD 12
A.2. MAXIMUM OUTPUT POWER 13

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A.3. PEAK POWER SPECTRAL DENSITY (CONDUCTED) 27
A.4. OCCUPIED 26DB BANDWIDTH(CONDUCTED) 31
A.5. BAND EDGES COMPLIANCE 50
A5.1 BAND EDGES - RADIATED 50
A.6. TRANSMITTER SPURIOUS EMISSION 67
A.7. AC POWERLINE CONDUCTED EMISSION (150KHZ- 30MHZ) 124
A.8. 99% OCCUPIED BANDWIDTH 127
A.9. POWER CONTROL 132

ANNEX B: EUT PARAMETERS 133

ANNEX C: ACCREDITATION CERTIFICATE 133

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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: 2022-04-20

Testing End Date: 2022-08-03

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:	Razer Inc.
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2.2 Manufacturer Information

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Address /Post:	9 Pasteur, Suite 100, Irvine, CA 92618, USA.
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Email:	Johnsen.tia@razer.com
Telephone:	+65 6571 6828

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

3.1. About EUT

Description	Gaming Tablet
Model name	RZ45-0460VWQ
FCC ID	RWO-RZ450460
WLAN Frequency Band	ISM Bands: -5150MHz~5250MHz -5250MHz~5350MHz -5470MHz~5725MHz
Type of modulation	OFDM/OFDMA
Antenna	Embedded Antenna
Voltage	3.87V

3.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version
UT65a	867034040041429	V4	Razer Edge 5G-12-user
UT09a	867034040039712	V4	Razer Edge 5G-12-user

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

*UT09a is used for Conduction test, UT65a is used for Radiation test.

3.3. Internal Identification of AE used during the test

AE ID*	Description		
AE1	Battery	/	Inbuilt
AE2	USB Cable	/	/
AE3	Adapter	/	/

AE1

Model	RC30-046001
Manufacturer	ATL
Capacitance	5000mAh
Nominal voltage	3.87V

AE2

Model	LS2-A001A
Manufacturer	/
Length	/

AE3

Model	A849-200225C-US 1
Manufacturer	/

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Note /

*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 Gaming Tablet with embedded antenna and inbuilt battery.

It has Bluetooth (EDR)function.

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 662911 D01	Emissions Testing of Transmitters with Multiple Outputs in the Same Band(e.g., MIMO, Smart Antenna, etc)	2013-10

5. LABORATORY ENVIRONMENT

Conducted RF performance testing is performed in shielding room.

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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	/	**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**
Frequency Stability	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	3.87V
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	2023-05-15
2	Test Receiver	ESCI 3	100344	R&S	1 year	2023-02-21
3	LISN	ENV216	101200	R&S	1 year	2022-06-29
4	Attenuator	10dB/2W	/	Rosenberger	/	/
5	Shielding Room	S81	/	ETS-Lindgren	/	/

Note:

The test dates were before the calibration due dates of equipment used (the LISN which series number is 101200)

Radiated emission test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Period	Calibration Due date
1	Test Receiver	ESW44	103023	R&S	1 year	2022-10-28
2	EMI Antenna	VULB 9163	483	SCHWARZBECK	1 year	2022-08-24
3	EMI Antenna	3115	00167250	ETS-Lindgren	1 year	2022-07-01
4	Loop Antenna	HFH2-Z2	829324/007	R&S	1 year	2022-12-22

Note:

The test dates were before the calibration due dates of equipment used (the EMI Antenna which series number is 00167250)

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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	4.92
30MHz ≤ f ≤ 1GHz	5.15
1GHz ≤ f ≤18GHz	5.54
18GHz ≤ f ≤40GHz	5.26

8.6. AC Power-line Conducted Emission

Measurement Uncertainty : 3.08,k=2

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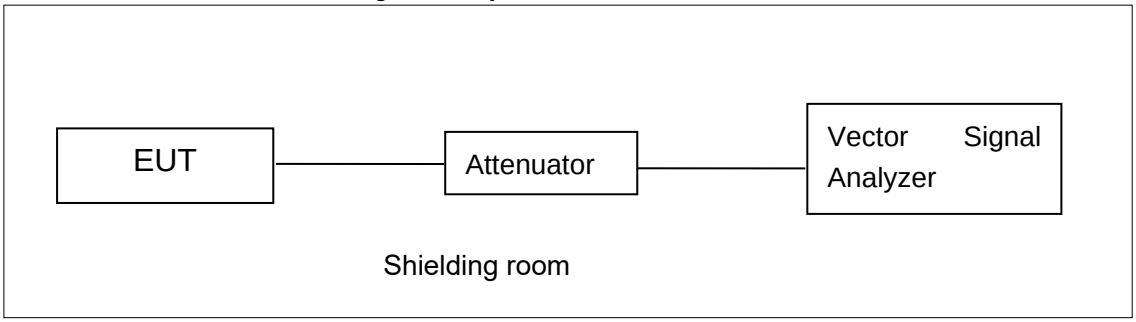
ANNEX A: MEASUREMENT RESULTS

A.1. Measurement Method

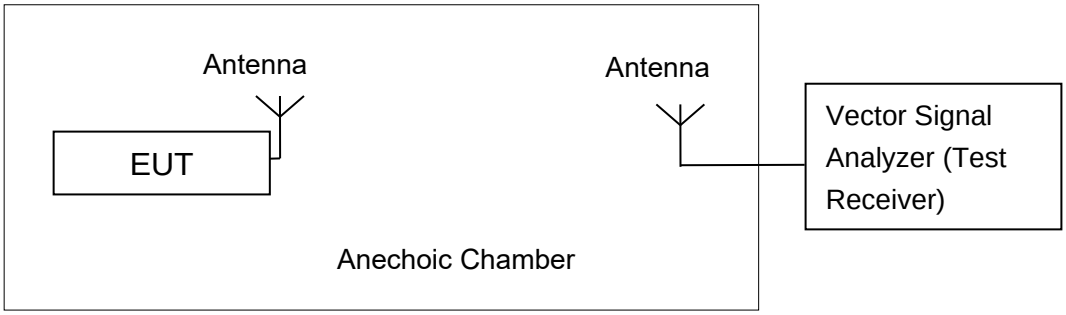
A.1.1. Conducted Measurements

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 = 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. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.

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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

BW	Frequency(MHz)	Ant4(dBi)	Ant5(dBi)	DG(dBi) Beamforming
20M	5180MHz	-0.4	-2.8	1.49
	5200MHz	-1.3	-2.5	1.13
	5240MHz	-2.6	-3.1	0.16
	5260MHz	-2.6	-3.1	0.16
	5280MHz	-2.1	-3.1	0.42
	5320MHz	-2.1	-3.1	0.42
	5500MHz	-1.6	-2.7	0.88
	5580MHz	-1.1	-2.2	1.38
	5700MHz	-2.6	-3.6	-0.08
	5720MHz	-2.6	-3.6	-0.08
40M	5190MHz	-1.3	-2.5	1.13
	5230MHz	-2.6	-3.1	0.16
	5270MHz	-2.6	-3.1	0.16
	5310MHz	-2.1	-3.1	0.42
	5510MHz	-1.6	-2.7	0.88
	5550MHz	-1.8	-3	0.63
	5670MHz	-1.4	-2	1.32
	5710MHz	-2.6	-3.6	-0.08
80M	5210MHz	-1.3	-2.5	1.13

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	5290MHz	-2.1	-3.1	0.42
	5530MHz	-1.8	-3	0.63
	5610MHz	-1.1	-2.2	1.38
	5690MHz	-2.6	-3.6	-0.08
160M	5210MHz	-2.6	-3.1	0.16
	5290MHz	-1.8	-3	0.63

For BF transmissions, power and PSD directional gain is calculated as:

Directional gain = 10 log [(10G1 /20 + 10G2 /20 + … + 10Gn /20) 2 /NANT] dBi, as following table for PSD. NANT = number of transmit antennas NSS = number of spatial streams. (The worst case directional gain will occur when NSS = 1)

Measurement Results:

SISO

802.11a mode

Channel	Test Result (dBm)	
	MCS0	
	Ant4	Ant5
5180MHz (Ch36)	16.44	17.15
5200MHz (Ch40)	16.73	17.52
5240MHz (Ch48)	16.67	17.68
5260MHz (Ch52)	16.92	17.51
5280MHz (Ch56)	16.78	17.40
5320MHz (Ch64)	16.52	17.27
5500MHz (Ch100)	17.15	16.77
5580MHz (Ch116)	17.46	17.23
5700MHz (Ch140)	17.21	17.78
5720MHz (Ch144)	16.91	17.45

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

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802.11n-HT20 mode

Channel	Test Result (dBm)	
	MCS0	
	Ant4	Ant5
5180MHz (Ch36)	15.53	16.06
5200MHz (Ch40)	15.59	16.35
5240MHz (Ch48)	15.45	16.62
5260MHz (Ch52)	15.88	16.45
5280MHz (Ch56)	15.70	16.19
5320MHz (Ch64)	15.21	15.89
5500MHz (Ch100)	16.13	15.49
5580MHz (Ch116)	16.60	15.94
5700MHz (Ch140)	16.26	16.22
5720MHz (Ch144)	16.05	16.30

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

802.11ac-VHT20 mode

Channel	Test Result (dBm)	
	MCS0	
	Ant4	Ant5
5180MHz (Ch36)	15.54	16.11
5200MHz (Ch40)	15.69	16.39
5240MHz (Ch48)	15.56	16.72
5260MHz (Ch52)	15.75	16.47
5280MHz (Ch56)	15.57	16.20

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5320MHz (Ch64)	15.40	16.03
5500MHz (Ch100)	16.09	15.43
5580MHz (Ch116)	16.63	15.77
5700MHz (Ch140)	16.30	16.53
5720MHz (Ch144)	16.05	16.23

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

802.11n-HT40 mode

Channel	**Test Result (dBm)**	
	MCS0	
	Ant4	**Ant5**
5190MHz (Ch38)	15.50	15.39
5230MHz (Ch46)	15.56	16.46
5270MHz (Ch54)	15.74	16.22
5310MHz (Ch62)	15.47	15.91
5510MHz (Ch102)	16.08	15.40
5550MHz (Ch110)	16.76	15.81
5670MHz (Ch134)	16.70	16.21
5710MHz (Ch142)	16.25	16.18

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

802.11ac-VHT40 mode

Channel	**Test Result (dBm)**	
	MCS0	
	Ant4	**Ant5**
5190MHz (Ch38)	15.57	16.15

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5230MHz (Ch46)	15.49	16.44
5270MHz (Ch54)	15.67	16.15
5310MHz (Ch62)	15.42	16.17
5510MHz (Ch102)	16.13	15.43
5550MHz (Ch110)	15.21	15.74
5670MHz (Ch134)	16.34	16.27
5710MHz (Ch142)	16.36	16.32

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

802.11ac-VHT80 mode

Channel	**Test Result (dBm)**	
	MCS0	
	Ant4	**Ant5**
5210MHz (Ch42)	14.61	15.41
5290MHz (Ch58)	14.55	15.09
5530MHz (Ch106)	15.14	14.42
5610MHz (Ch122)	15.54	14.71
5690MHz (Ch138)	15.44	15.17

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

802.11ac-VHT160 mode

Channel	**Test Result (dBm)**	
	MCS0	
	Ant4	**Ant5**
5250MHz (Ch50)	8.75	9.91
5570MHz (Ch114)	8.66	8.29

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802.11ax-HE20 mode(full RU)

Channel	Test Result (dBm)	
	MCS0	
	Ant4	Ant5
5180MHz (Ch36)	16.56	17.12
5200MHz (Ch40)	16.16	17.18
5240MHz (Ch48)	16.21	17.49
5260MHz (Ch52)	16.12	16.76
5280MHz (Ch56)	16.03	16.87
5320MHz (Ch64)	15.93	16.89
5500MHz (Ch100)	16.42	16.12
5580MHz (Ch116)	16.57	16.31
5700MHz (Ch140)	16.56	17.05
5720MHz (Ch144)	16.45	16.98

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

802.11ax-HE40 mode(fill RU)

Channel	Test Result (dBm)	
	MCS0	
	Ant4	Ant5
5190MHz (Ch38)	16.52	17.14
5230MHz (Ch46)	16.61	17.44
5270MHz (Ch54)	16.42	17.23
5310MHz (Ch62)	16.14	16.98

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5510MHz (Ch102)	16.77	16.87
5550MHz (Ch110)	16.49	16.46
5670MHz (Ch134)	16.41	17.05
5710MHz (Ch142)	16.68	16.94

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

802.11ax-HE80 mode(full RU)

Channel	Test Result (dBm)	
	MCS0	
	Ant4	Ant5
5210MHz (Ch42)	15.83	16.37
5290MHz (Ch58)	15.70	16.16
5530MHz (Ch106)	15.46	15.36
5610MHz (Ch122)	15.39	15.52
5690MHz (Ch138)	15.81	15.78

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

802.11ax-HE160 mode(full RU)

Channel	Test Result (dBm)	
	MCS0	
	Ant4	Ant5
5250MHz (Ch50)	9.68	11.08
5570MHz (Ch114)	10.72	10.11

MIMO

802.11a mode

Channel	Test Result (dBm)

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	MCS0		
	Ant4	Ant5	Sum
5180MHz (Ch36)	15.89	16.73	19.34
5200MHz (Ch40)	15.91	16.82	19.40
5240MHz (Ch48)	16.05	16.94	19.53
5260MHz (Ch52)	16.03	16.81	19.45
5280MHz (Ch56)	15.94	16.62	19.30
5320MHz (Ch64)	15.98	16.31	19.16
5500MHz (Ch100)	16.51	16.34	19.44
5580MHz (Ch116)	16.49	16.12	19.32
5700MHz (Ch140)	15.98	16.19	19.10
5720MHz (Ch144)	15.93	16.16	19.06

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

802.11n-HT20 mode

Channel	Test Result (dBm)		
	MCS0		
	Ant4	Ant5	Sum
5180MHz (Ch36)	15.06	15.54	18.32
5200MHz (Ch40)	15.03	15.43	18.24
5240MHz (Ch48)	14.74	15.81	18.32
5260MHz (Ch52)	15.10	15.41	18.27
5280MHz (Ch56)	14.78	15.16	17.98
5320MHz (Ch64)	14.81	15.21	18.02
5500MHz (Ch100)	15.63	14.75	18.22
5580MHz (Ch116)	15.64	14.50	18.12

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5700MHz (Ch140)	15.03	15.19	18.12
5720MHz (Ch144)	14.95	14.72	17.85

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

802.11ac-VHT20 mode

Channel	Test Result (dBm)		
	MCS0		
	Ant4	Ant5	Sum
5180MHz (Ch36)	15.18	15.85	18.54
5200MHz (Ch40)	14.96	15.33	18.16
5240MHz (Ch48)	14.86	15.83	18.38
5260MHz (Ch52)	15.11	15.75	18.45
5280MHz (Ch56)	14.82	15.23	18.04
5320MHz (Ch64)	14.60	15.19	17.92
5500MHz (Ch100)	15.56	14.67	18.15
5580MHz (Ch116)	15.63	14.82	18.25
5700MHz (Ch140)	15.22	15.14	18.19
5720MHz (Ch144)	14.86	15.09	17.99

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

802.11n-HT40 mode

Channel	Test Result (dBm)		
	MCS0		
	Ant4	Ant5	Sum
5190MHz (Ch38)	14.95	15.95	18.49
5230MHz (Ch46)	14.79	16.02	18.46

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5270MHz (Ch54)	15.42	15.66	18.55
5310MHz (Ch62)	14.81	15.37	18.11
5510MHz (Ch102)	15.71	14.79	18.28
5550MHz (Ch110)	15.83	14.83	18.37
5670MHz (Ch134)	15.18	15.07	18.14
5710MHz (Ch142)	15.17	15.42	18.31

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

802.11ac-VHT40 mode

Channel	**Test Result (dBm)**		
	MCS0		
	Ant4	**Ant5**	**Sum**
5190MHz (Ch38)	15.29	15.95	18.64
5230MHz (Ch46)	14.86	16.14	18.56
5270MHz (Ch54)	15.23	15.86	18.57
5310MHz (Ch62)	14.82	15.23	18.04
5510MHz (Ch102)	15.46	14.81	18.16
5550MHz (Ch110)	15.82	14.72	18.32
5670MHz (Ch134)	15.17	14.96	18.08
5710MHz (Ch142)	15.08	15.28	18.19

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

802.11ac-VHT80 mode

Channel	**Test Result (dBm)**		
	MCS0		
	Ant4	**Ant5**	**Sum**

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5210MHz (Ch42)	14.18	14.74	17.48
5290MHz (Ch58)	13.83	14.38	17.12
5530MHz (Ch106)	14.33	13.77	17.07
5610MHz (Ch122)	14.53	13.58	17.09
5690MHz (Ch138)	14.26	13.82	17.06

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

802.11ac-VHT160 mode

Channel	**Test Result (dBm)**		
	MCS0		
	Ant4	**Ant5**	**Sum**
5250MHz (Ch50)	8.47	9.52	12.04
5570MHz (Ch114)	8.42	8.11	11.28

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

802.11ax-HE20 mode(full RU)

Channel	**Test Result (dBm)**		
	MCS0		
	Ant4	**Ant5**	**Sum**
5180MHz (Ch36)	16.25	17.11	19.71
5200MHz (Ch40)	16.17	17.15	19.70
5240MHz (Ch48)	16.18	17.41	19.85
5260MHz (Ch52)	16.18	16.77	19.50
5280MHz (Ch56)	16.09	16.83	19.49
5320MHz (Ch64)	15.88	16.95	19.46
5500MHz (Ch100)	16.41	16.07	19.25

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5580MHz (Ch116)	16.48	16.28	19.39
5700MHz (Ch140)	16.86	17.14	20.01
5720MHz (Ch144)	16.54	16.91	19.74

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

802.11ax-HE40 mode(full RU)

Channel	Test Result (dBm)		
	MCS0		
	Ant4	Ant5	Sum
5190MHz (Ch38)	16.45	17.07	19.78
5230MHz (Ch46)	16.58	17.55	20.10
5270MHz (Ch54)	16.52	17.08	19.82
5310MHz (Ch62)	16.35	17.02	19.71
5510MHz (Ch102)	16.86	16.45	19.67
5550MHz (Ch110)	16.97	16.87	19.93
5670MHz (Ch134)	16.30	17.17	19.77
5710MHz (Ch142)	16.70	16.97	19.85

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

802.11ax-HE80 mode(full RU)

Channel	Test Result (dBm)		
	MCS0		
	Ant4	Ant5	Sum
5210MHz (Ch42)	15.63	16.57	19.14
5290MHz (Ch58)	15.66	16.12	18.91
5530MHz (Ch106)	15.32	15.32	18.33

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5610MHz (Ch122)	15.46	15.72	18.60
5690MHz (Ch138)	15.70	15.78	18.75

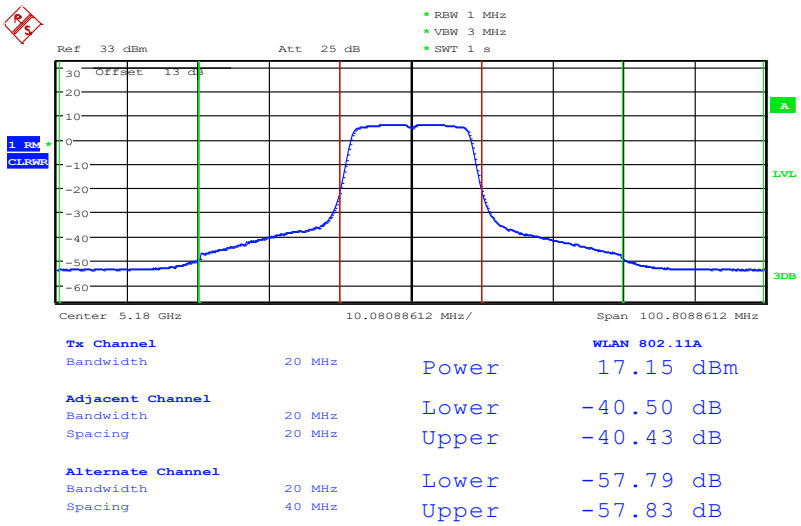
The data rate MCS0 is selected as worse condition, and the following cases are performed with this condition.

802.11ax-HE160 mode(full RU)

Channel	Test Result (dBm)		
	MCS0		
	Ant4	Ant5	Sum
5250MHz (Ch50)	10.11	11.15	13.67
5570MHz (Ch114)	10.69	10.19	13.46

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

802.11a-5180MHz-ant5:



Duty Cycle

Mode	11a	11n20	11ac20	11ax20	11n40	11ac40	11ax40	11ac80	11ax80	11ac160	11ax160

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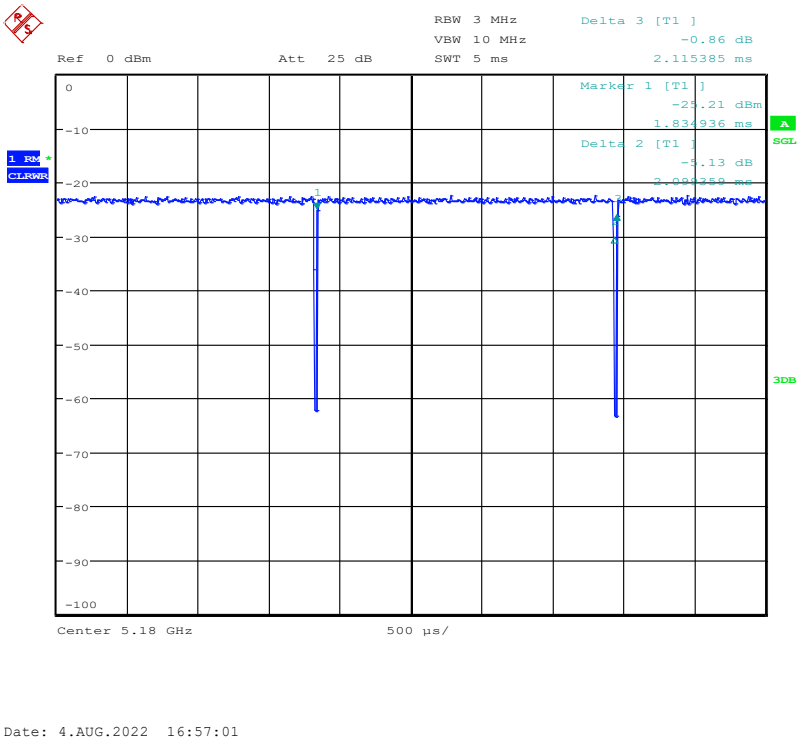
Duty Cycle	99%	99%	99%	99%	99%	99%	99%	99%	98%	99%	98%



Note: The following cases are performed with this condition:

a) The maximum power of 802.11ax20/40/80/160 are got with full RU (SISO/MIMO);

b) 802.11a/ac20/ac160 mode (Ant5) 802.11n40/ac80 (Ant4) are selected as the worst condition (SISO);

802.11ax20/40/80/160 mode (Ant5) are selected as the worst condition (SISO);

c) 802.11a/ac20/ac40/ac80/ac160/ax20/ax40/ax80/ax160 mode (Ant5) are selected as the worst condition (MIMO);

d) The 802.11ax20 mode (compare with 802.11n20/ac20), 802.11ax40 mode (compare with 802.11n40/ac40), 802.11ax80 mode (compare with 802.11ac80), 802.11ax160 mode (compare with 802.11ac160) are selected as the worst condition (MIMO);

e) The 802.11ax20 mode (compare with 802.11n20/ac20), 802.11ax40 mode (compare with 802.11n40/ac40), 802.11ax80 mode (compare with 802.11ac80), 802.11ax160 mode (compare with 802.11ac160) are selected as the worst condition (SISO Ant5).

Conclusion: PASS

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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:

SISO-Ant5

Mode	Frequency	Power Spectral Density (dBm/MHz)	Conclusion
802.11a	5180 MHz	5.91	P
	5200 MHz	6.02	P
	5240 MHz	6.02	P
	5260 MHz	6.03	P
	5280 MHz	6.02	P
	5320 MHz	5.91	P
	5500 MHz	4.58	P
	5580 MHz	4.97	P
	5700 MHz	5.65	P
	5720 MHz	5.30	P
802.11ac VHT20	5180 MHz	4.64	P
	5200 MHz	4.55	P
	5240 MHz	4.82	P
	5260 MHz	4.68	P
	5280 MHz	4.62	P
	5320 MHz	4.59	P
	5500 MHz	2.90	P
	5580 MHz	3.44	P
	5700 MHz	4.38	P
	5720 MHz	4.30	P
802.11ac VHT160	5250MHz	-10.90	P
	5570MHz	-12.20	P

Mode	Frequency	Power Spectral Density (dBm/MHz)	Conclusion
802.11ax HE20(full RU)	5180 MHz	4.08	P
	5200 MHz	4.17	P

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	5240 MHz	4.59	P
	5260 MHz	3.87	P
	5280 MHz	3.76	P
	5320 MHz	3.86	P
	5500 MHz	3.38	P
	5580 MHz	3.21	P
	5700 MHz	4.02	P
	5720 MHz	3.99	P
802.11ax HE40(full RU)	5190 MHz	1.13	P
	5230 MHz	1.58	P
	5270 MHz	0.90	P
	5310 MHz	0.66	P
	5510 MHz	0.43	P
	5550 MHz	0.48	P
	5670 MHz	1.07	P
	5710 MHz	0.98	P
802.11ax HE80(full RU)	5210MHz	-2.58	P
	5290MHz	-3.05	P
	5530MHz	-3.65	P
	5610MHz	-3.44	P
	5690MHz	-3.44	P
802.11ax HE160(full RU)	5250MHz	-10.27	P
	5570MHz	-10.73	P

SISO-Ant4

Mode	Frequency	Power Spectral Density (dBm/MHz)	Conclusion
802.11n HT40	5190 MHz	2.81	P
	5230 MHz	2.85	P
	5270 MHz	3.10	P
	5310 MHz	2.96	P
	5510 MHz	1.31	P
	5550 MHz	1.52	P
	5670 MHz	2.53	P
	5710 MHz	2.52	P
802.11ac VHT80	5210MHz	-2.14	P
	5290MHz	-2.11	P
	5530MHz	-4.24	P
	5610MHz	-3.59	P
	5690MHz	-2.84	P

MIMO

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Mode	Frequency	Power Spectral Density (dBm/MHz)			Conclusion
		Ant4	Ant5	Sum	
802.11a	5180 MHz	5.18	6.11	8.68	P
	5200 MHz	5.12	5.79	8.48	P
	5240 MHz	5.16	6.19	8.72	P
	5260 MHz	5.43	6.03	8.75	P
	5280 MHz	5.15	5.89	8.55	P
	5320 MHz	4.92	5.61	8.29	P
	5500 MHz	5.74	5.14	8.46	P
	5580 MHz	5.40	5.15	8.29	P
	5700 MHz	5.20	5.55	8.39	P
	5720 MHz	5.88	5.82	8.86	P
802.11ac VHT20	5180 MHz	4.62	5.66	8.18	P
	5200 MHz	4.59	5.64	8.16	P
	5240 MHz	5.01	6.03	8.56	P
	5260 MHz	4.83	5.49	8.18	P
	5280 MHz	5.06	5.30	8.19	P
	5320 MHz	4.44	4.97	7.72	P
	5500 MHz	5.28	4.87	8.09	P
	5580 MHz	5.53	4.71	8.15	P
	5700 MHz	5.15	5.43	8.30	P
	5720 MHz	5.74	5.33	8.55	P
802.11ac VHT40	5190 MHz	1.45	2.01	4.75	P
	5230 MHz	1.42	2.19	4.83	P
	5270 MHz	1.72	1.76	4.75	P
	5310 MHz	1.35	1.07	4.22	P
	5510 MHz	1.93	0.78	4.40	P
	5550 MHz	2.05	0.88	4.51	P
	5670 MHz	2.10	1.11	4.64	P
	5710 MHz	1.95	0.87	4.45	P
802.11ac VHT80	5210MHz	-2.87	-2.39	0.39	P
	5290MHz	-2.80	-2.57	0.33	P
	5530MHz	-2.55	-3.75	-0.10	P
	5610MHz	-1.88	-3.41	0.43	P
	5690MHz	-2.15	-3.03	0.44	P
802.11ac VHT160	5250MHz	-12.11	-10.81	-8.40	P
	5570MHz	-11.89	-12.30	-9.08	P
802.11ax HE20(full RU)	5180 MHz	3.96	4.56	7.28	P
	5200 MHz	3.83	4.56	7.22	P
	5240 MHz	3.91	5.03	7.52	P

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	5260 MHz	3.84	4.47	7.18	P
	5280 MHz	3.71	4.42	7.09	P
	5320 MHz	3.50	4.49	7.03	P
	5500 MHz	4.11	3.78	6.96	P
	5580 MHz	4.01	3.78	6.91	P
	5700 MHz	4.33	4.56	7.46	P
	5720 MHz	4.15	4.60	7.39	P
802.11ax HE40(full RU)	5190 MHz	0.84	1.58	4.24	P
	5230 MHz	0.99	2.06	4.57	P
	5270 MHz	0.81	1.47	4.16	P
	5310 MHz	0.65	1.30	4.00	P
	5510 MHz	1.07	0.75	3.92	P
	5550 MHz	1.31	0.86	4.10	P
	5670 MHz	0.83	1.57	4.23	P
	5710 MHz	1.32	1.55	4.45	P
802.11ax HE80(full RU)	5210MHz	-3.34	-2.48	0.12	P
	5290MHz	-3.28	-2.83	-0.04	P
	5530MHz	-3.40	-3.58	-0.48	P
	5610MHz	-3.42	-3.12	-0.26	P
	5690MHz	-2.94	-3.27	-0.09	P
802.11ax HE160 (full RU)	5250MHz	-11.00	-9.79	-7.34	P
	5570MHz	-10.18	-10.61	-7.38	P

802.11a-5180MHz-ant5:

Conclusion: PASS

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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)		conclusion
802.11a	5180 MHz	Fig.1	20.10	P
	5200 MHz	Fig.2	20.05	P
	5240 MHz	Fig.3	20.20	P
	5260 MHz	Fig.4	20.05	P
	5280 MHz	Fig.5	20.05	P
	5320 MHz	Fig.6	19.00	P
	5500 MHz	Fig.7	19.85	P
	5580 MHz	Fig.8	19.90	P
	5700 MHz	Fig.9	20.05	P
	5720 MHz	Fig.10	20.00	P
802.11ax HE20	5180 MHz	Fig.11	22.65	P
	5200 MHz	Fig.12	22.65	P
	5240 MHz	Fig.13	22.80	P
	5260 MHz	Fig.14	23.25	P
	5280 MHz	Fig.15	23.20	P
	5320 MHz	Fig.16	23.15	P
	5500 MHz	Fig.17	23.10	P
	5580 MHz	Fig.18	22.85	P
	5700 MHz	Fig.19	23.25	P
	5720 MHz	Fig.20	23.65	P
802.11ax HE40	5190 MHz	Fig.21	43.04	P
	5230 MHz	Fig.22	43.12	P
	5270 MHz	Fig.23	43.20	P
	5310 MHz	Fig.24	43.04	P
	5510 MHz	Fig.25	43.04	P
	5550 MHz	Fig.26	43.28	P
	5670 MHz	Fig.27	44.24	P
	5710 MHz	Fig.28	43.84	P
802.11ax HE80	5210MHz	Fig.29	89.44	P
	5290MHz	Fig.30	88.32	P

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	5530MHz	Fig.31	87.84	P
	5610MHz	Fig.32	88.48	P
	5690MHz	Fig.33	89.28	P
802.11ax HE160	5250MHz	Fig.34	171.20	P
	5570MHz	Fig.35	169.60	P

Conclusion: PASS

Test graphs as below:

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

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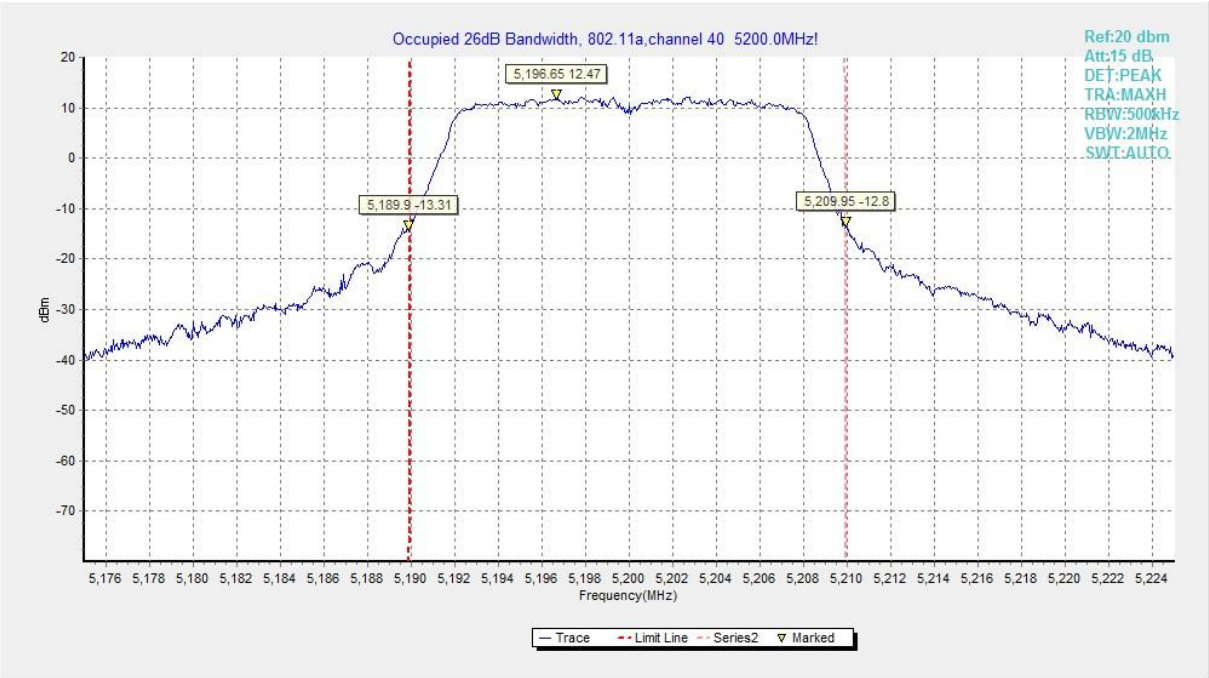

Fig.2 Occupied 26dB Bandwidth (802.11a, 5200MHz)

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

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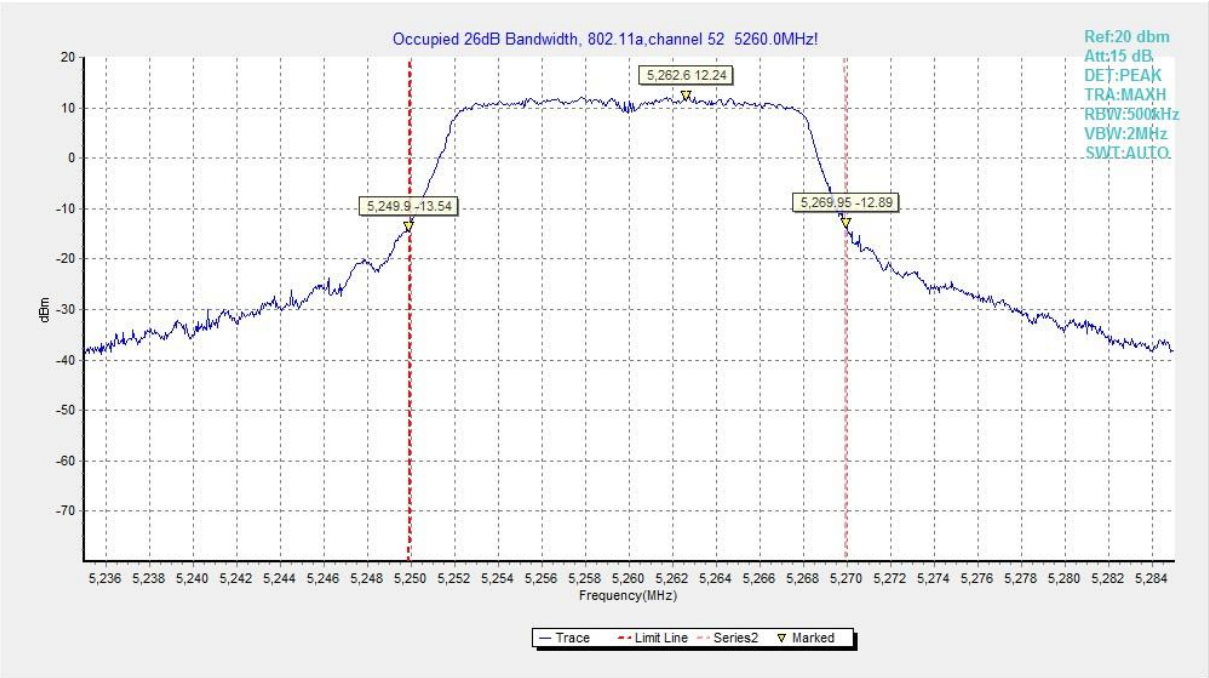

Fig.4 Occupied 26dB Bandwidth (802.11a, 5260MHz)

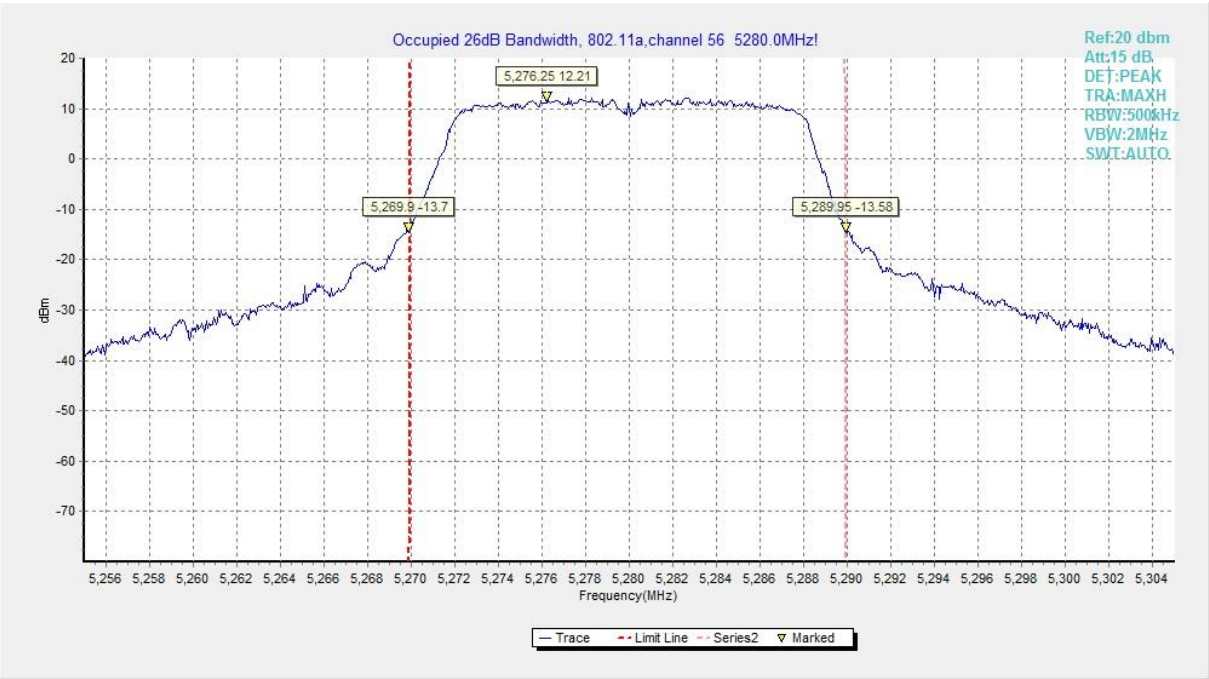

Fig.5 Occupied 26dB Bandwidth (802.11a, 5280MHz)

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

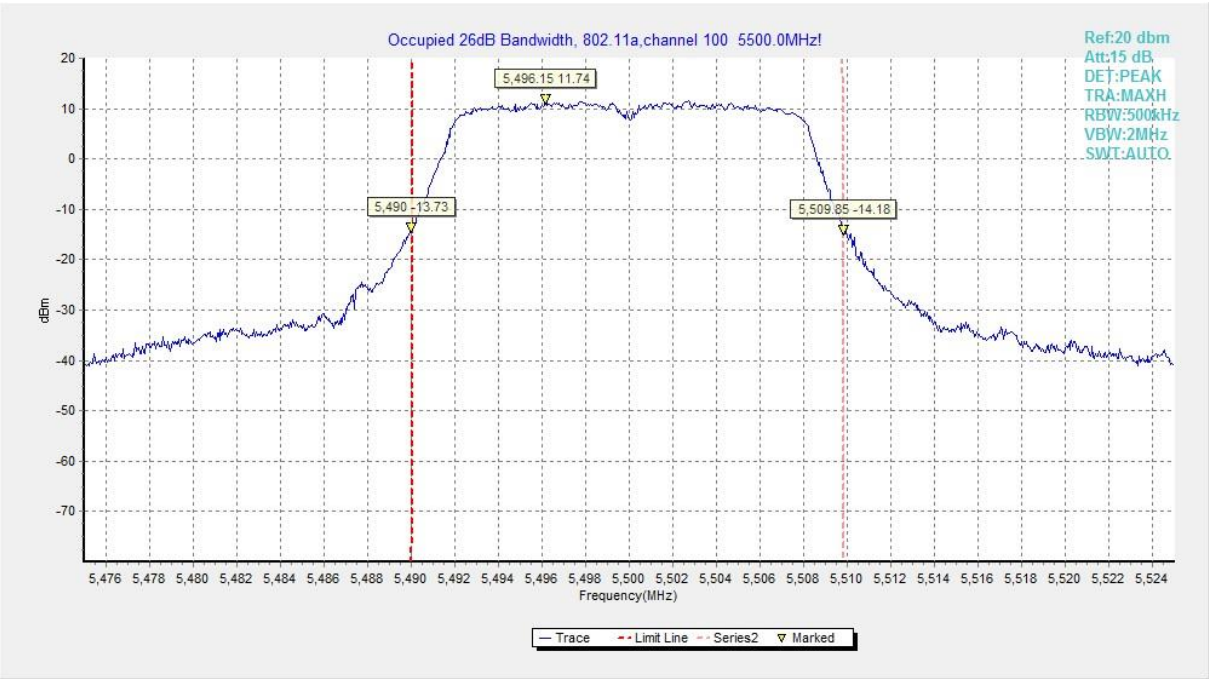

Fig.7 Occupied 26dB Bandwidth (802.11a, 5500MHz)

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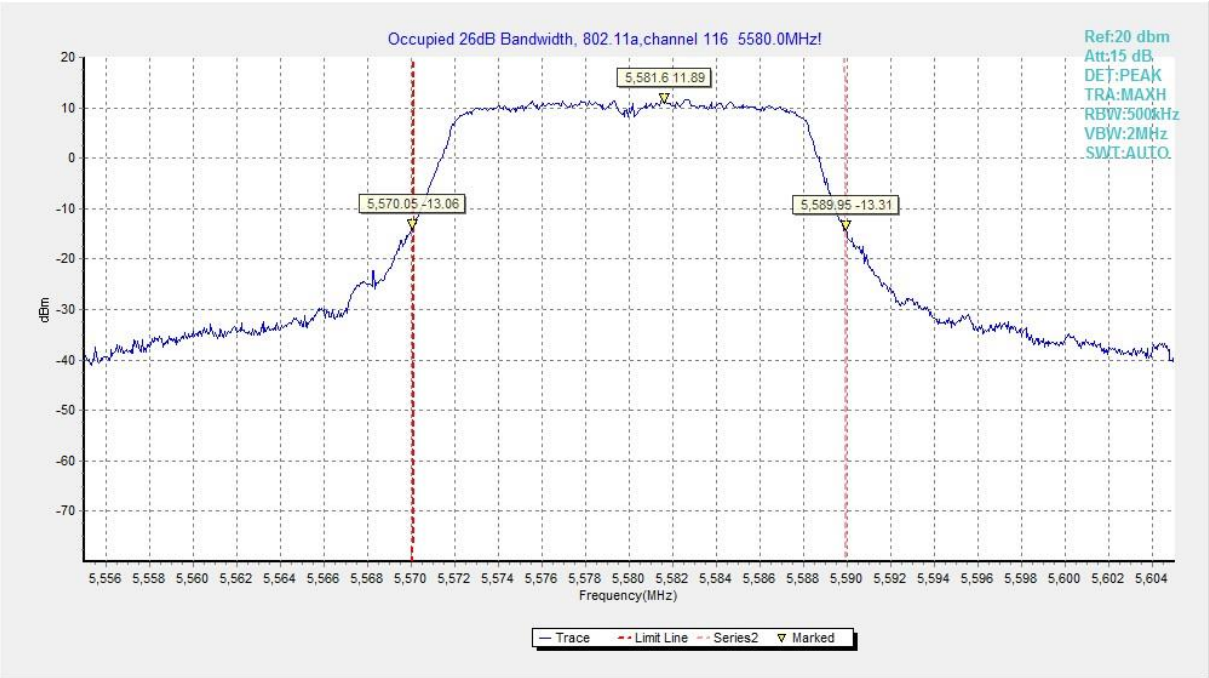

Fig.8 Occupied 26dB Bandwidth (802.11a, 5580MHz)

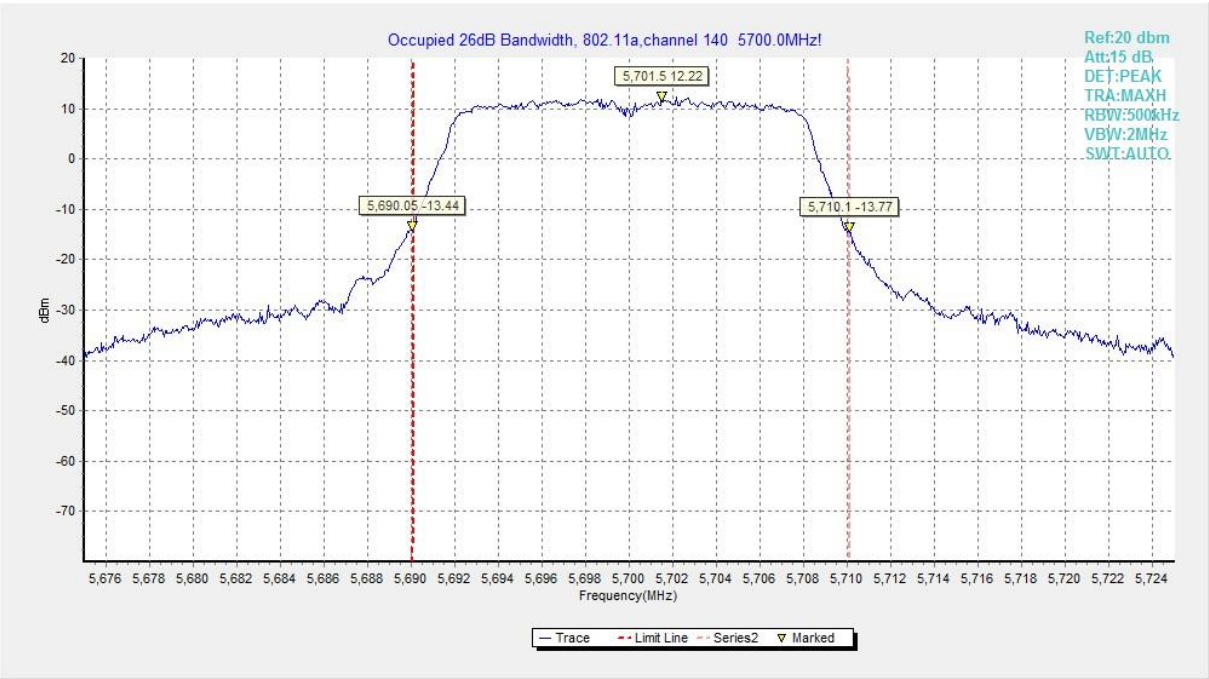

Fig.9 Occupied 26dB Bandwidth (802.11a, 5700MHz)

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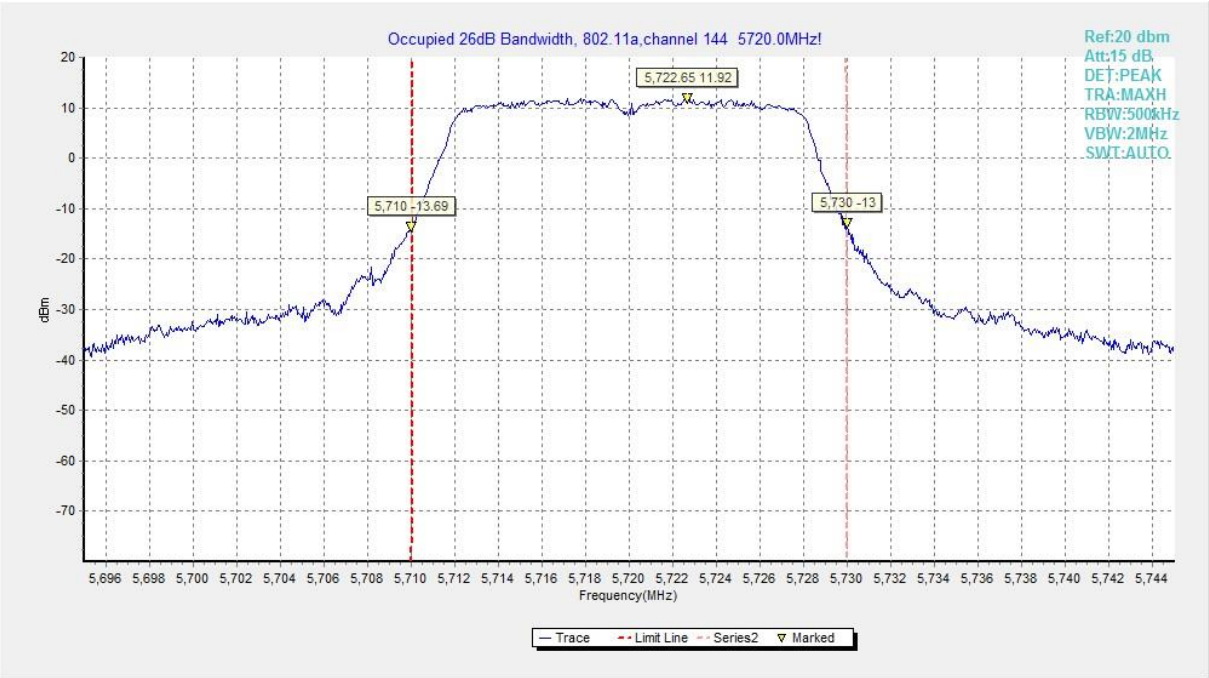

Fig.10 Occupied 26dB Bandwidth (802.11a, 5720MHz)

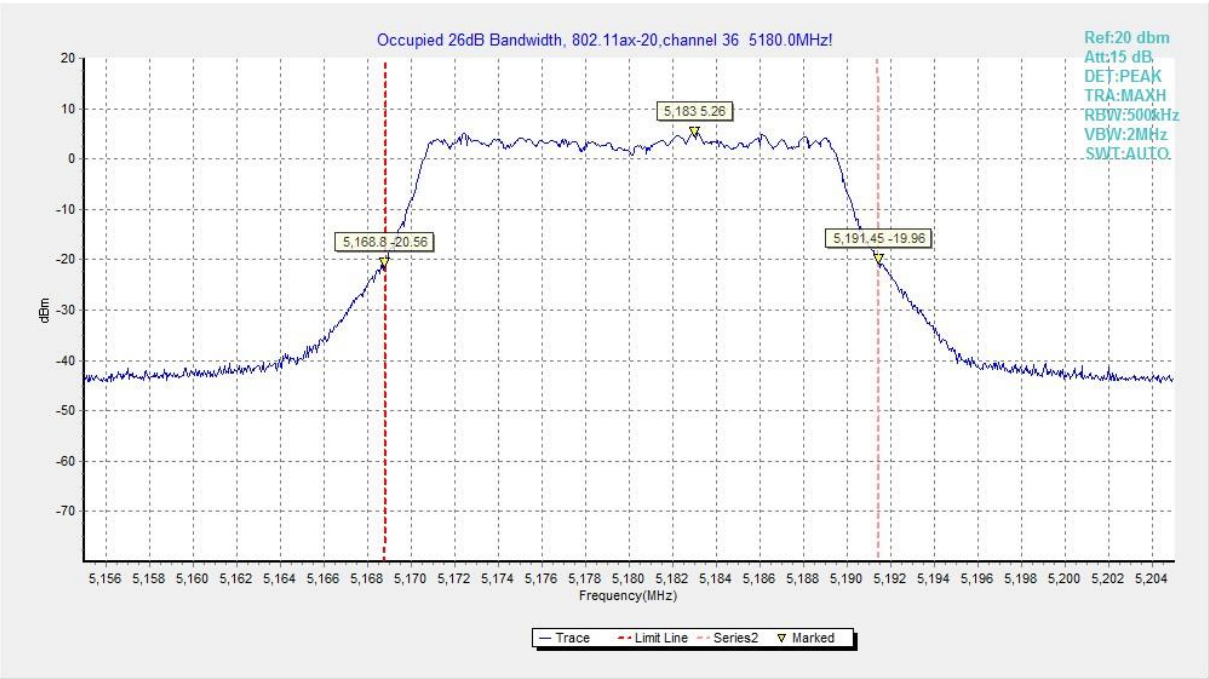

Fig.11 Occupied 26dB Bandwidth (802.11ax-HE20, 5180MHz)

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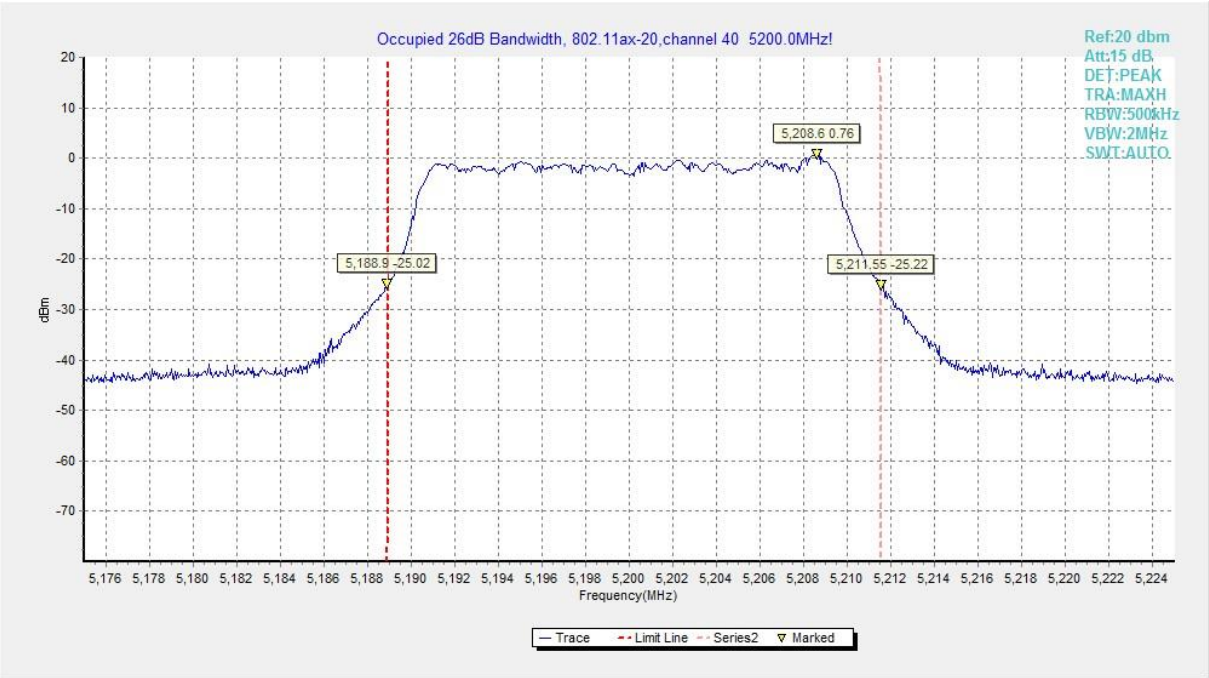

Fig.12 Occupied 26dB Bandwidth (802.11ax-HE20, 5200MHz)

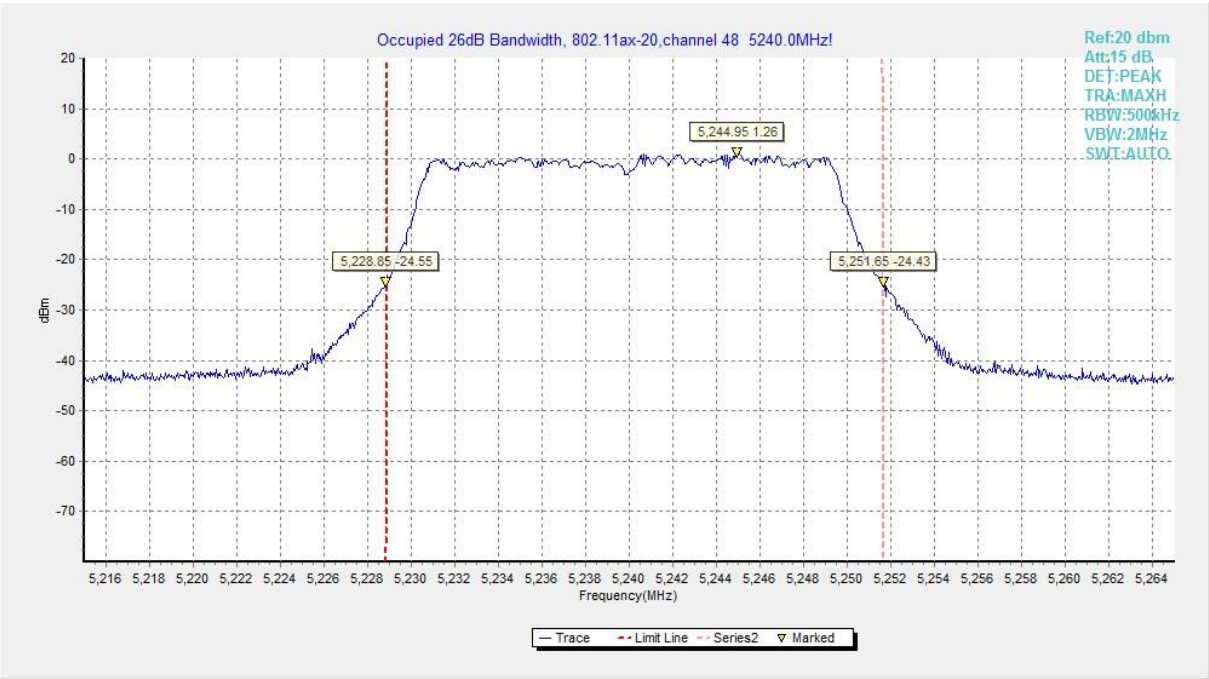

Fig.13 Occupied 26dB Bandwidth (802.11ax-HE20, 5240MHz)

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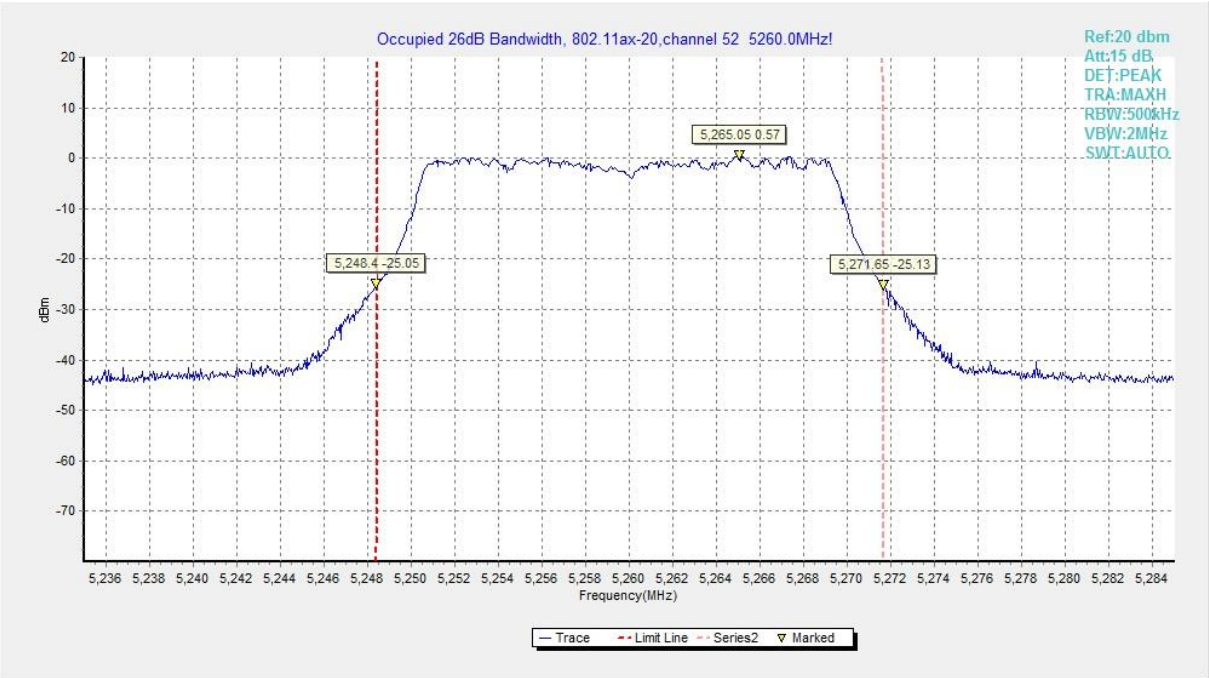

Fig.14 Occupied 26dB Bandwidth (802.11ax-HE20, 5260MHz)

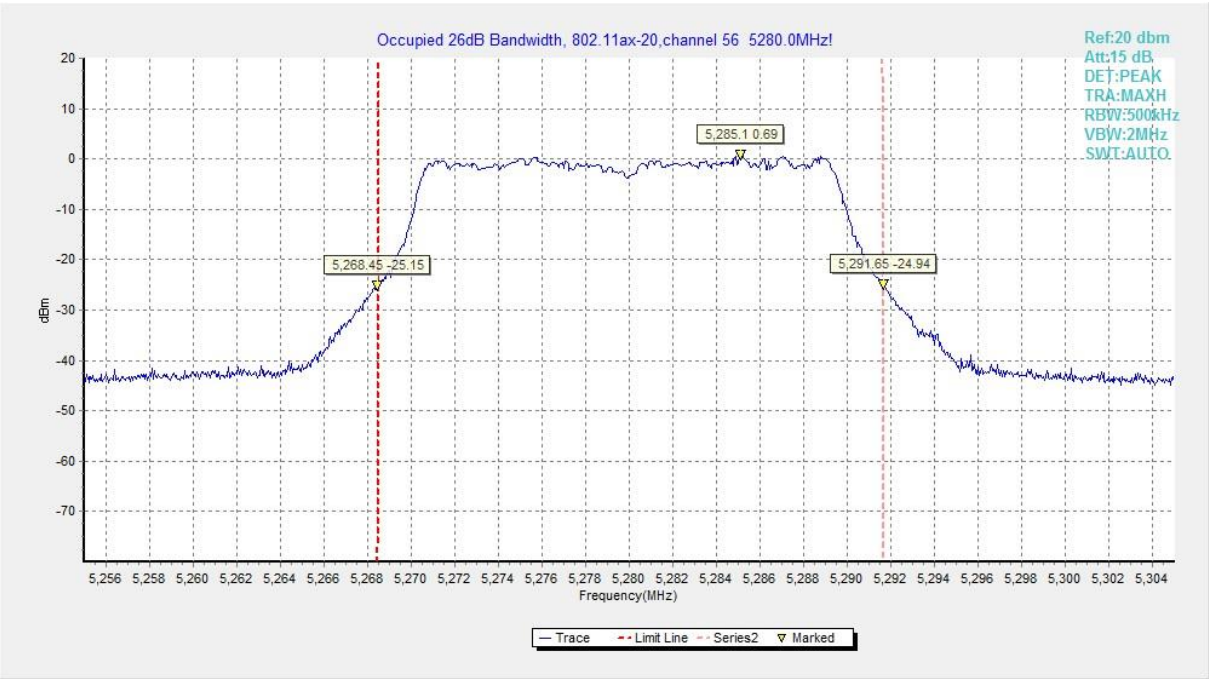

Fig.15 Occupied 26dB Bandwidth (802.11ax-HE20, 5280MHz)

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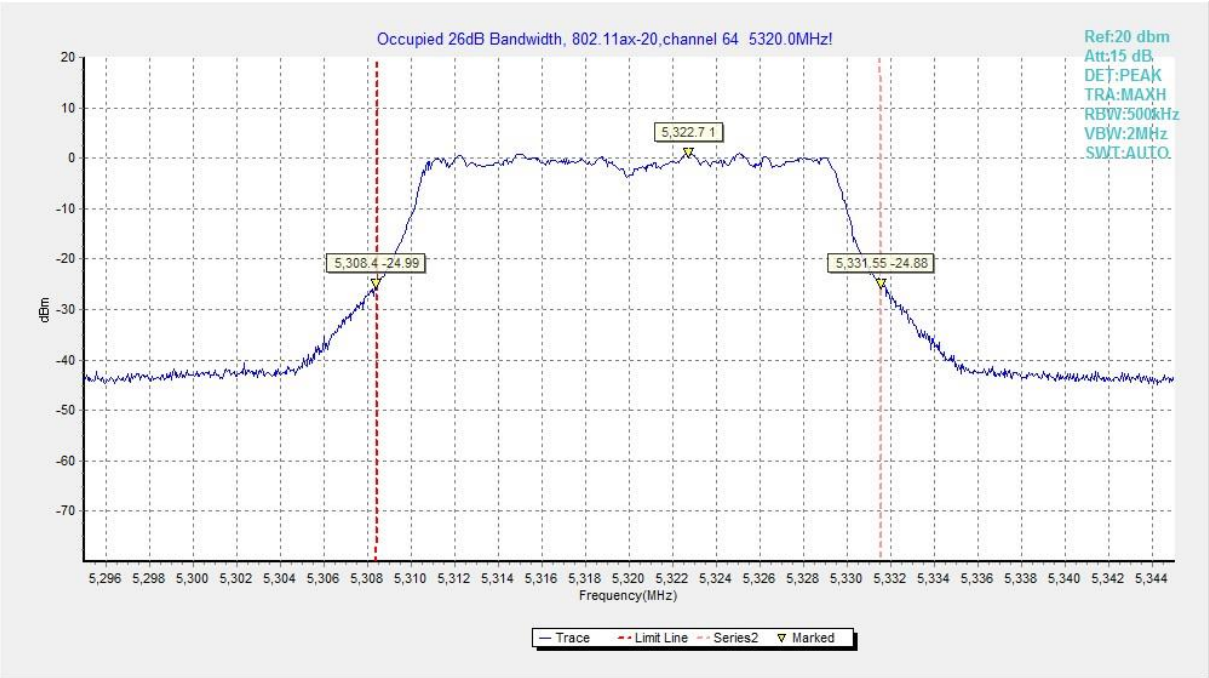

Fig.16 Occupied 26dB Bandwidth (802.11n-HT20, 5320MHz)

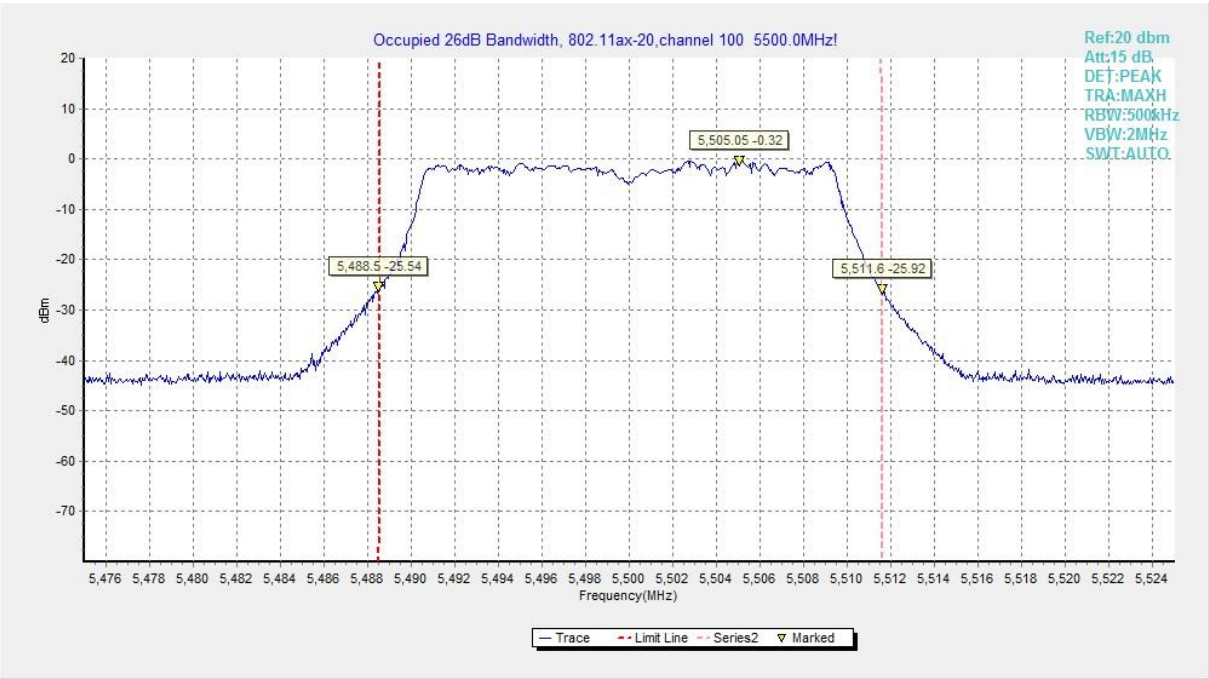

Fig.17 Occupied 26dB Bandwidth (802.11ax-HE20, 5500MHz)

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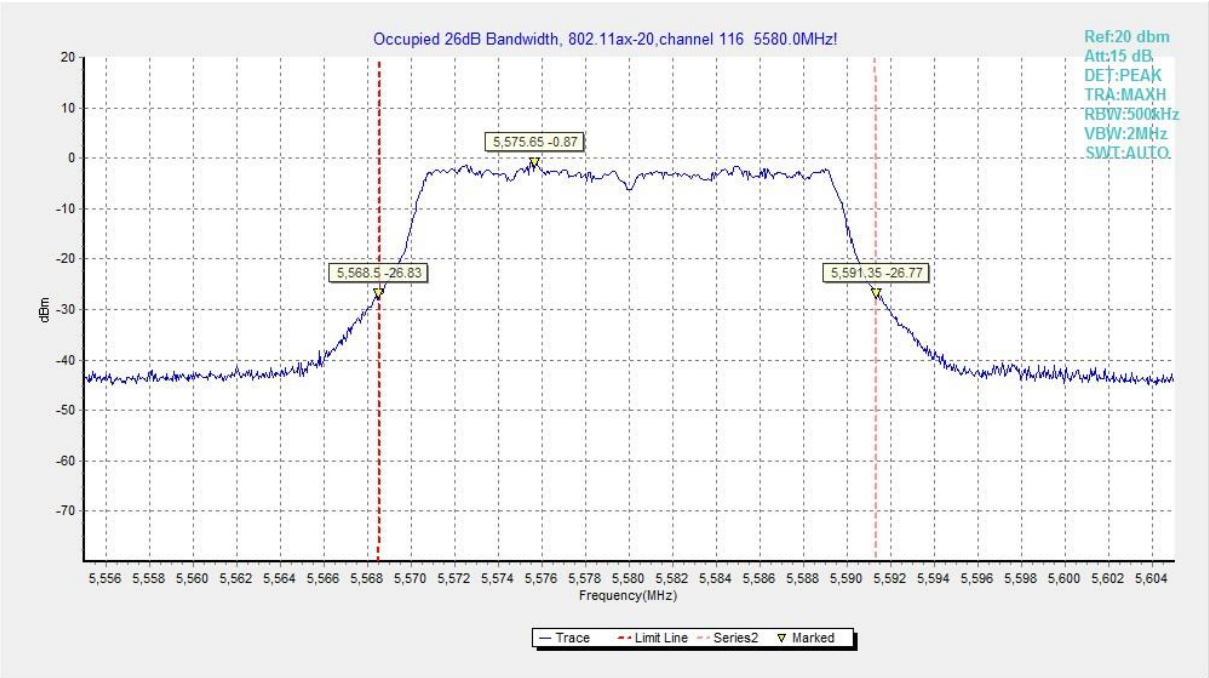

Fig.18 Occupied 26dB Bandwidth (802.11ax-HE20, 5580MHz)

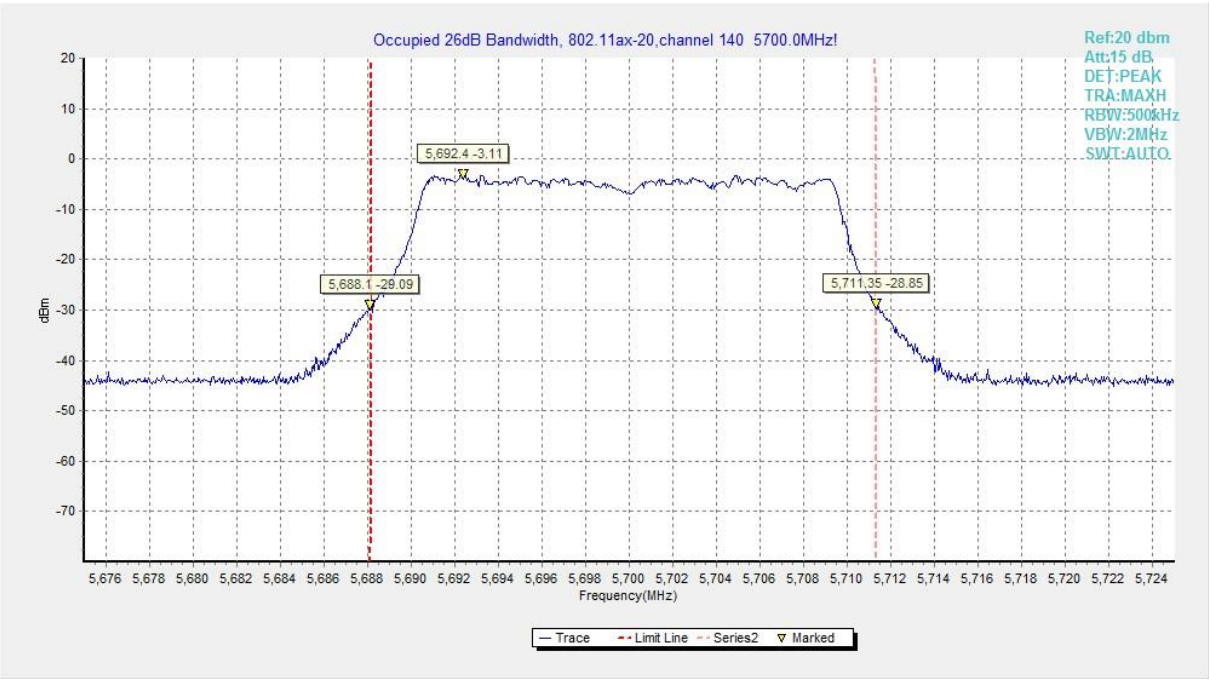

Fig.19 Occupied 26dB Bandwidth (802.11ax-HE20, 5700MHz)

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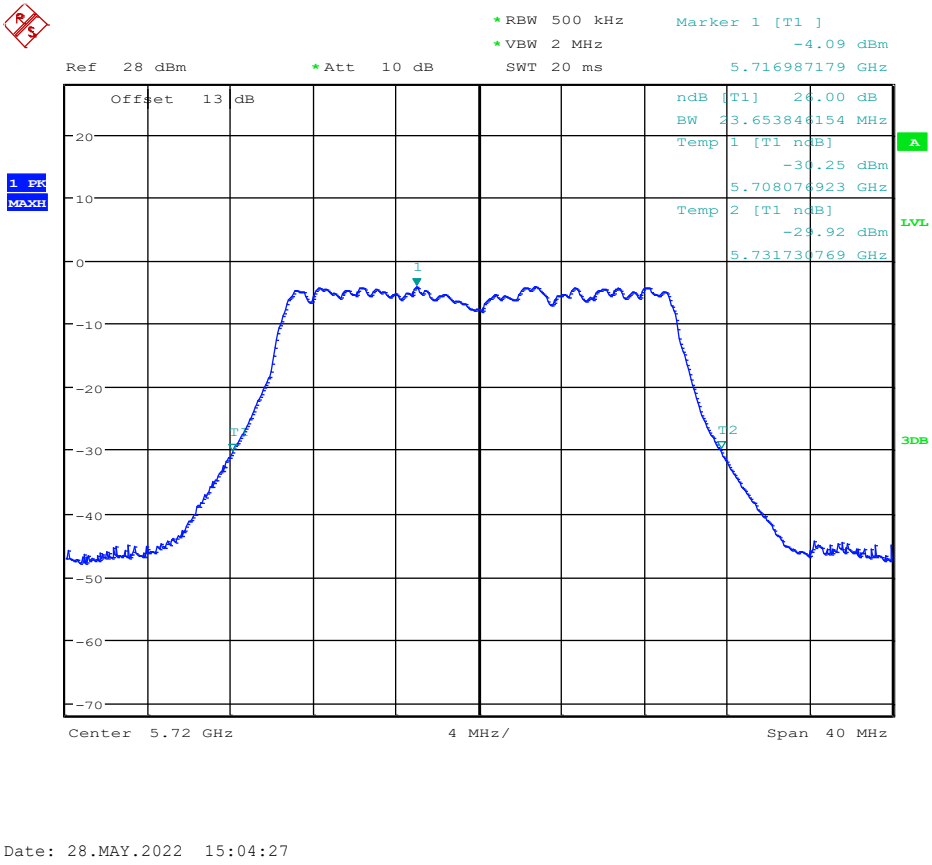

Fig.20 Occupied 26dB Bandwidth (802.11ax-HE20, 5720MHz)

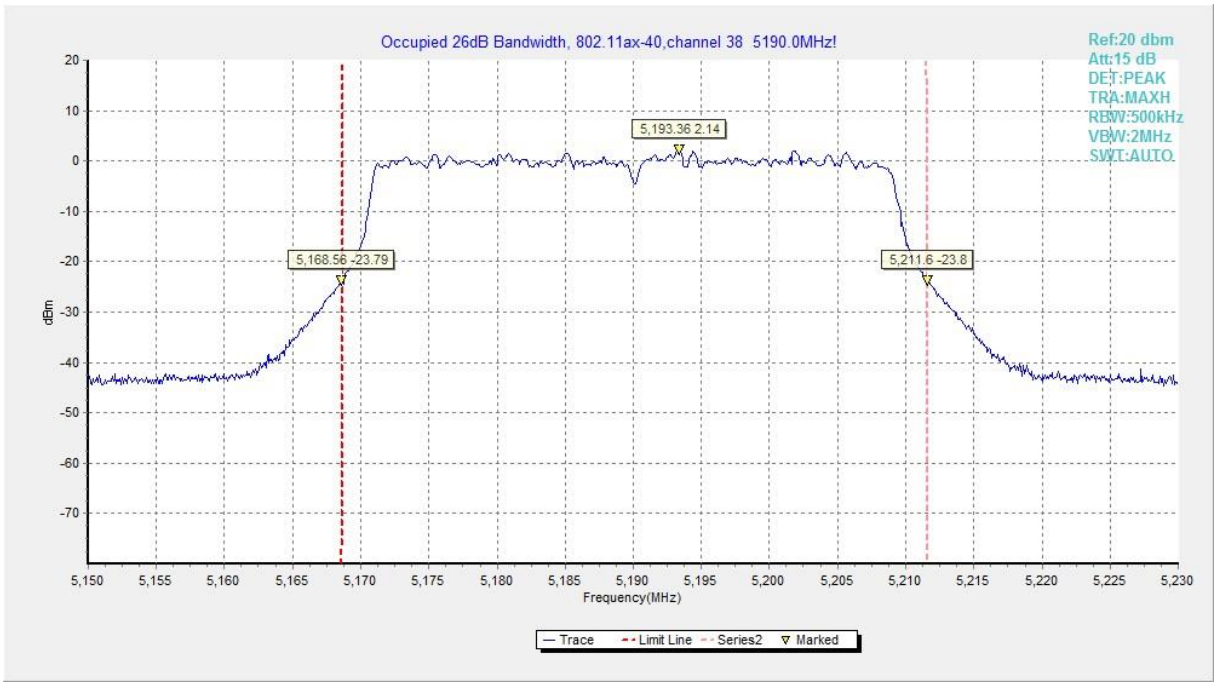

Fig.21 Occupied 26dB Bandwidth (802.11ax-HE40, 5190MHz)

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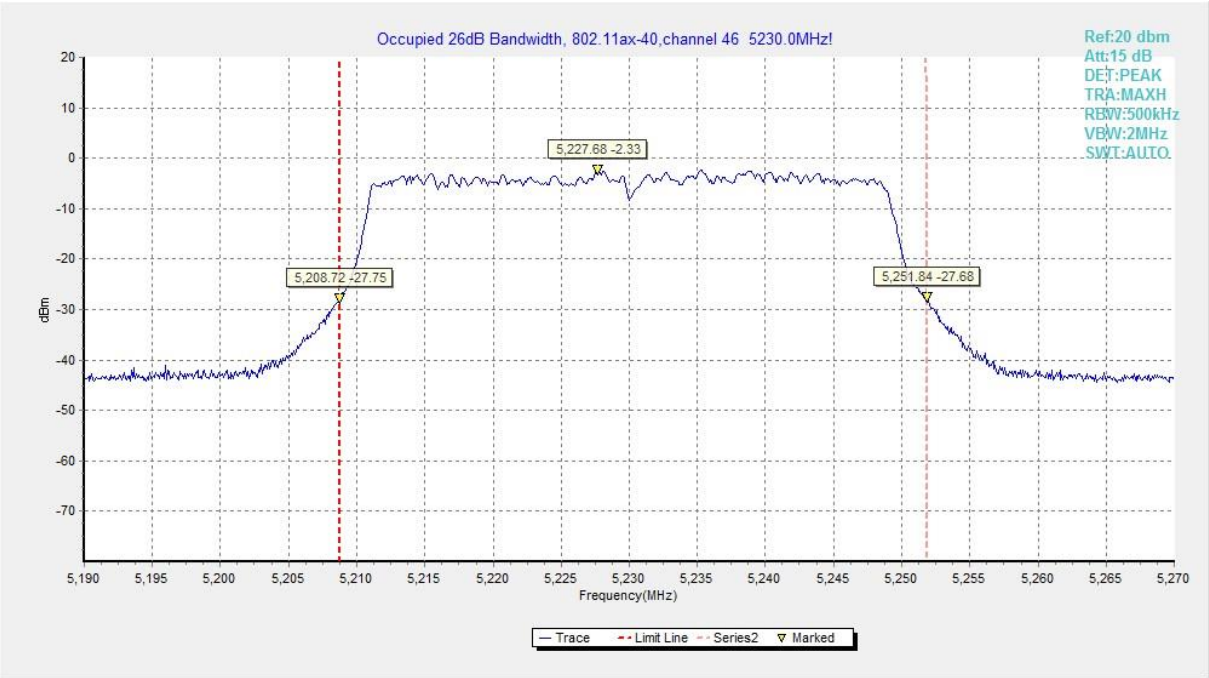

Fig.22 Occupied 26dB Bandwidth (802.11ax-HE40, 5230MHz)

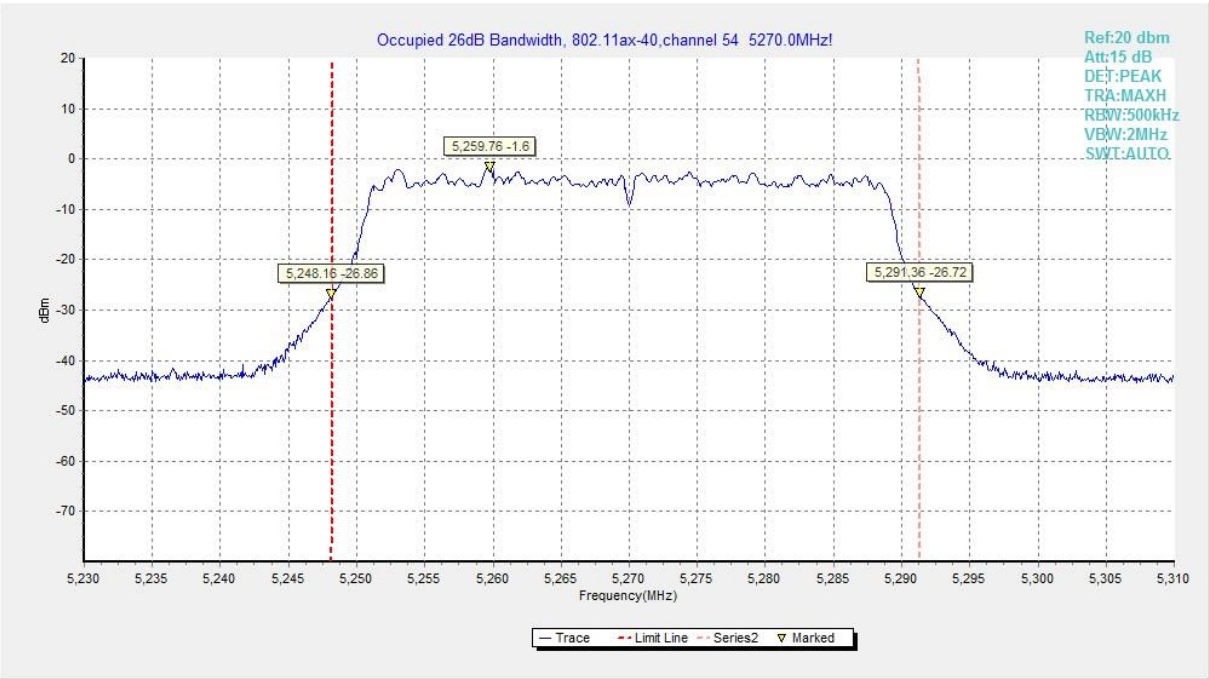

Fig.23 Occupied 26dB Bandwidth (802.11ax-HE40, 5270MHz)

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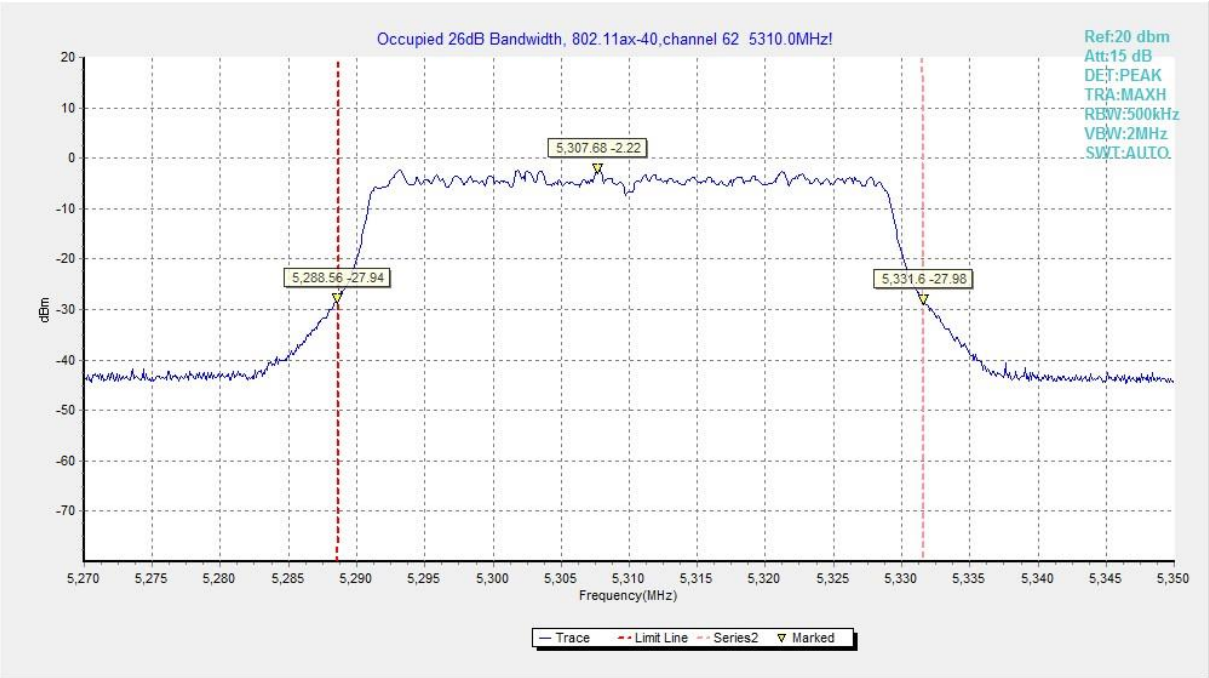

Fig.24 Occupied 26dB Bandwidth (802.11ax-HE40, 5310MHz)

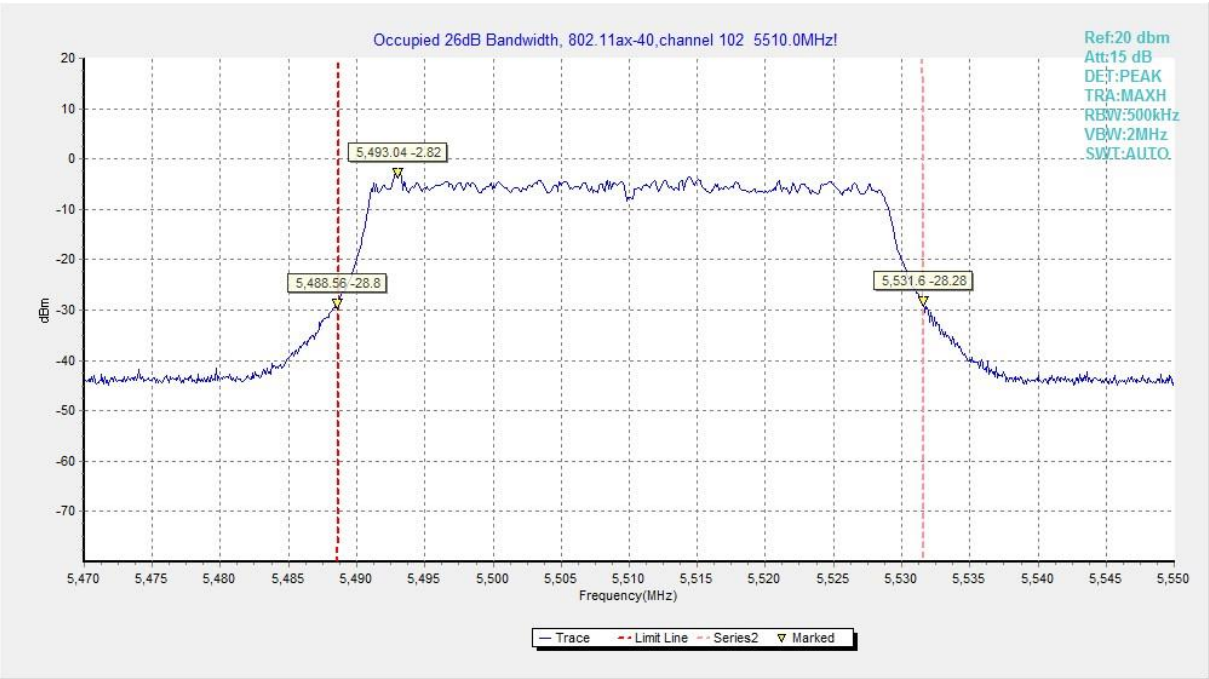

Fig.25 Occupied 26dB Bandwidth (802.11ax-HE40, 5510MHz)

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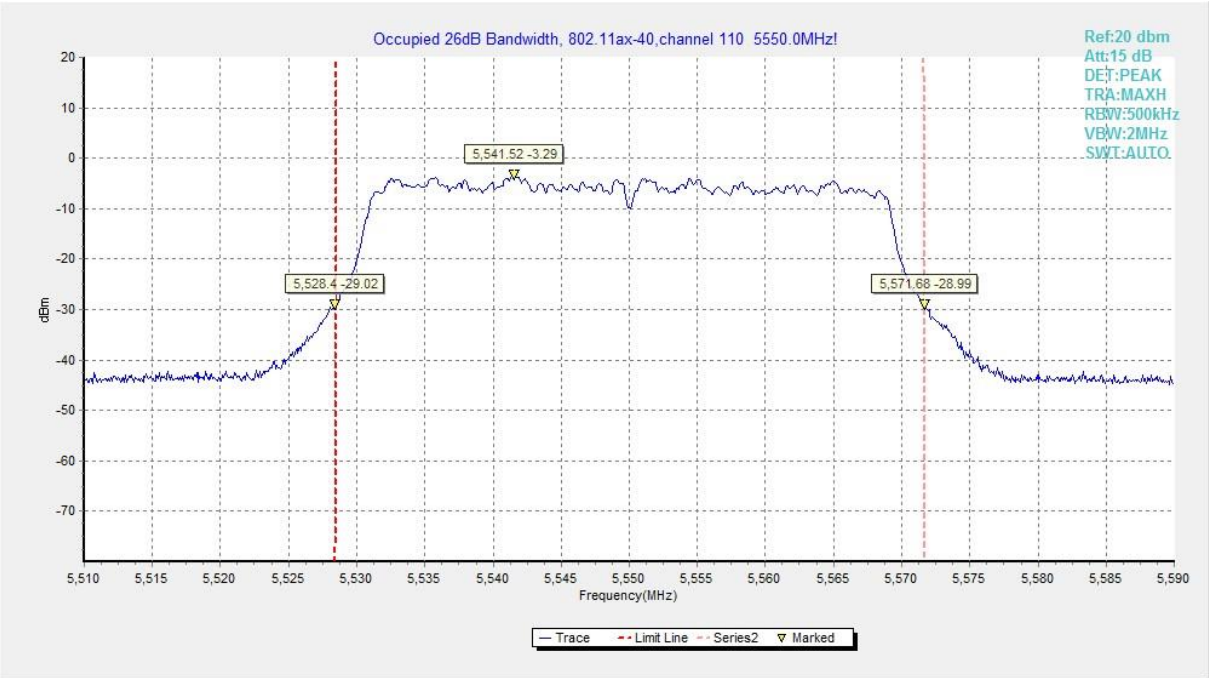

Fig.26 Occupied 26dB Bandwidth (802.11ax-HE40, 5590MHz)

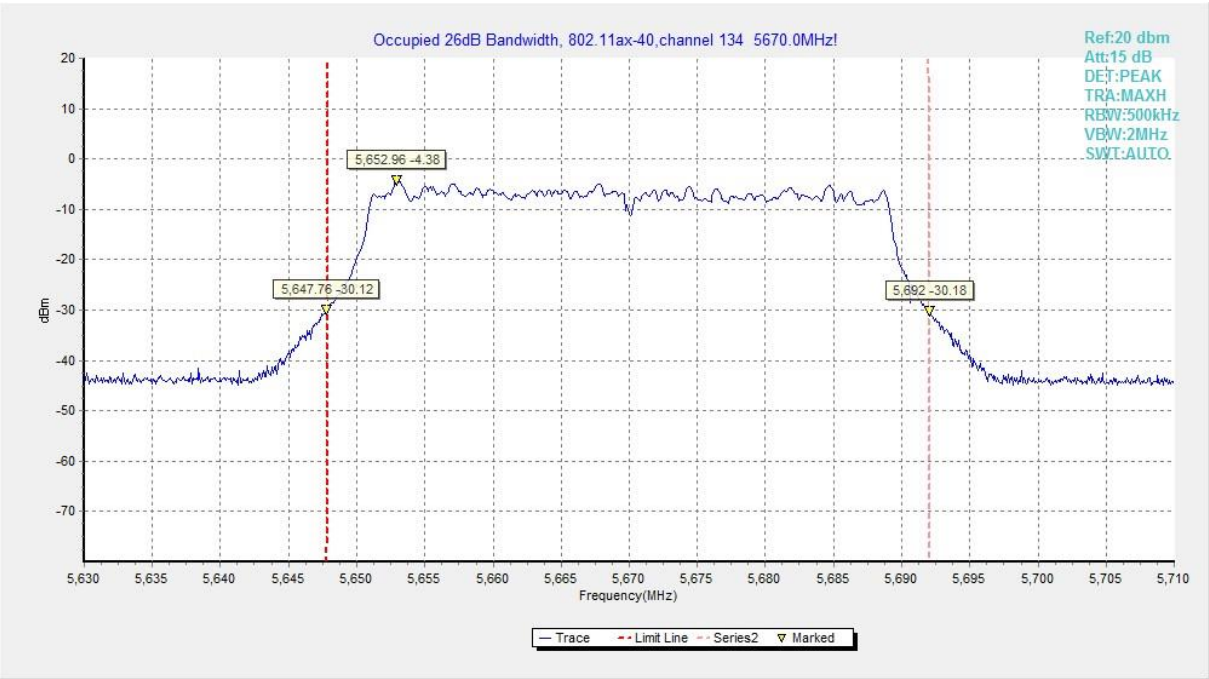

Fig.27 Occupied 26dB Bandwidth (802.11ax-HE40, 5670MHz)

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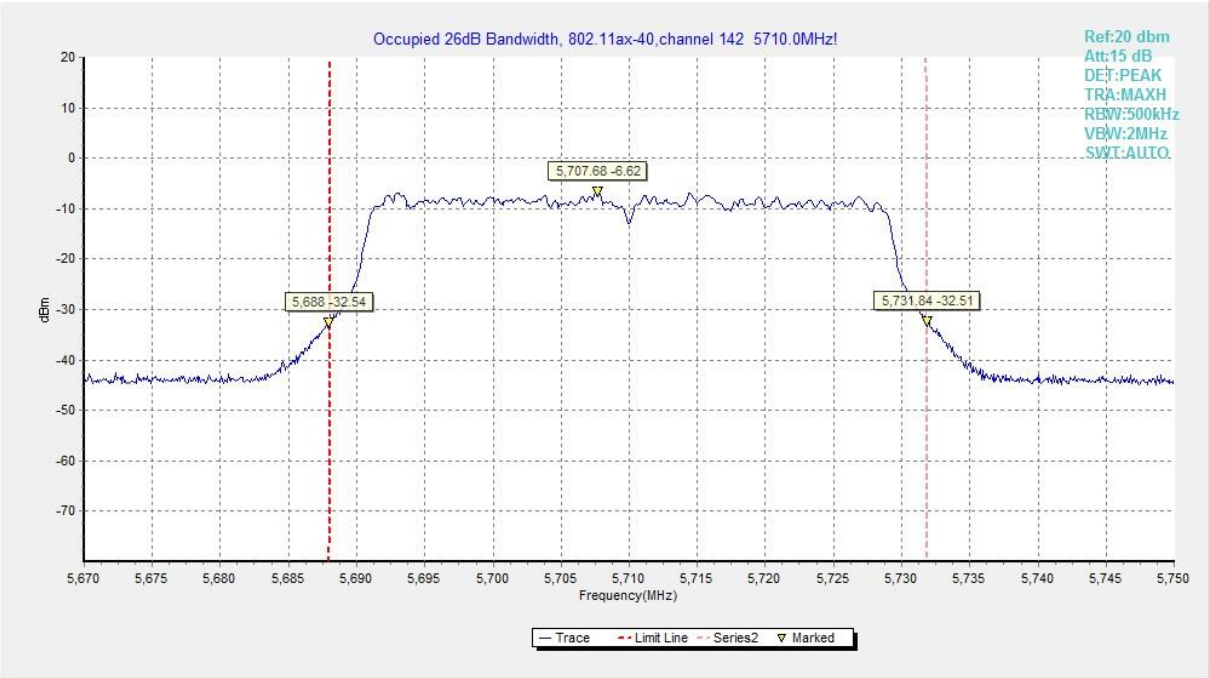

Fig.28 Occupied 26dB Bandwidth (802.11ax-HE40, 5710MHz)

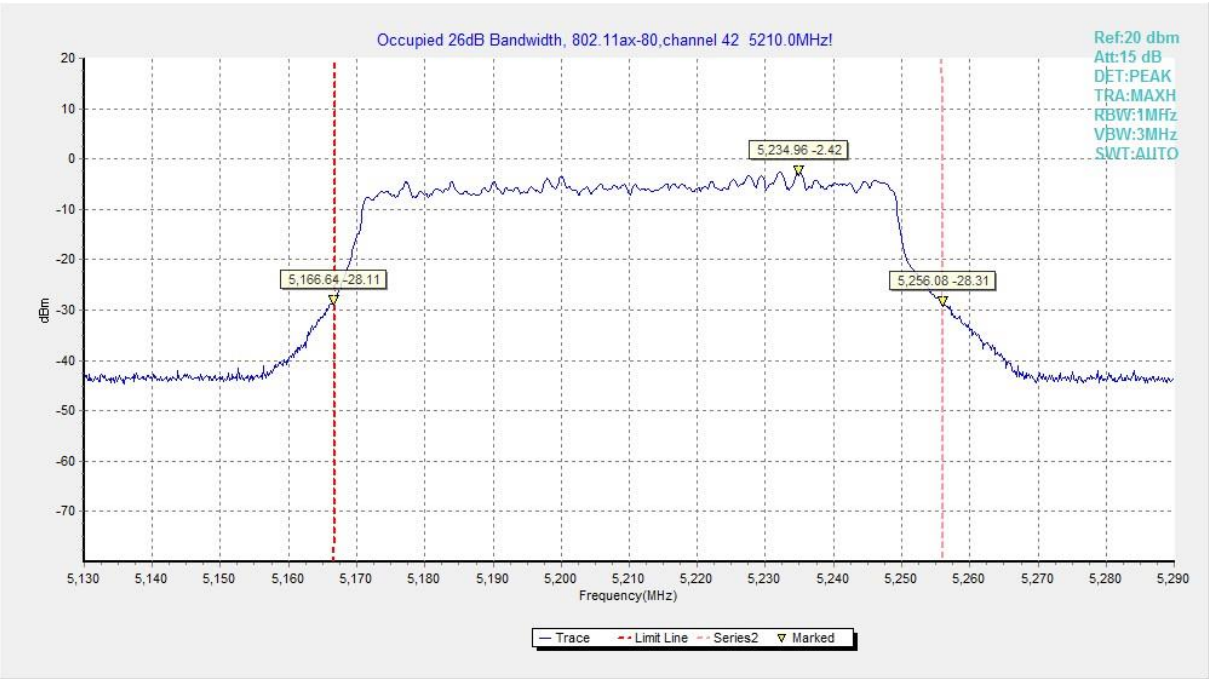

Fig.29 Occupied 26dB Bandwidth (802. 11ax-HE80, 5210MHz)

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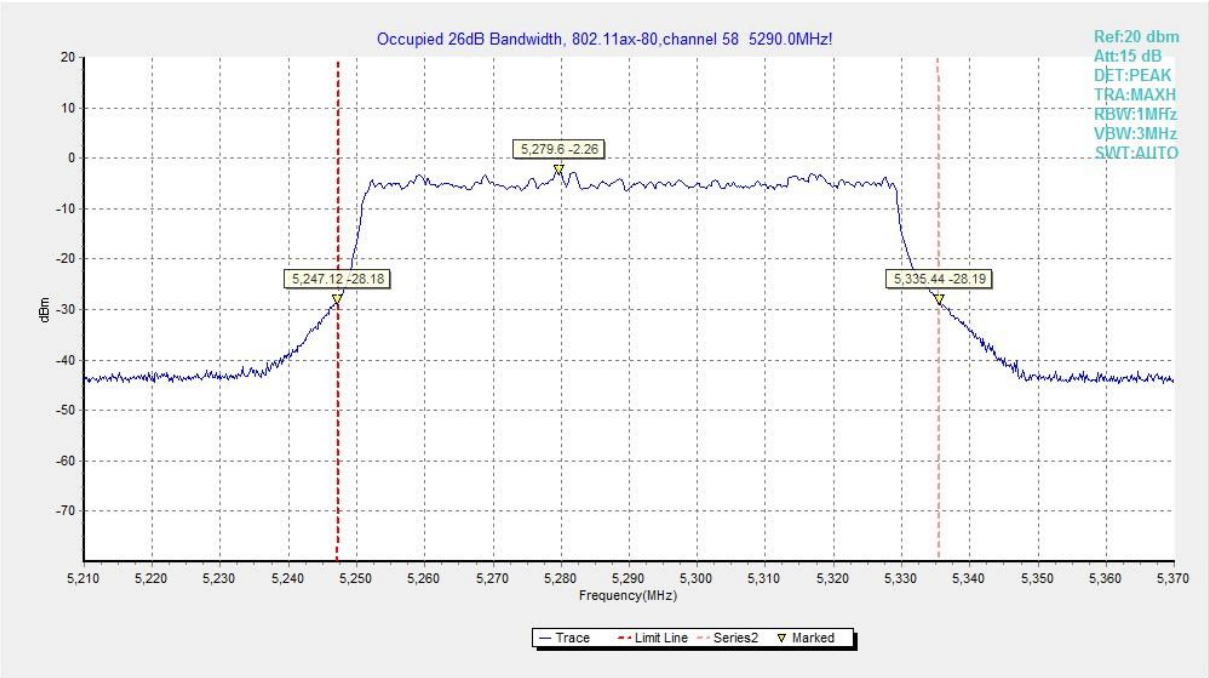

Fig.30 Occupied 26dB Bandwidth (802. 11ax-HE80, 5290MHz)

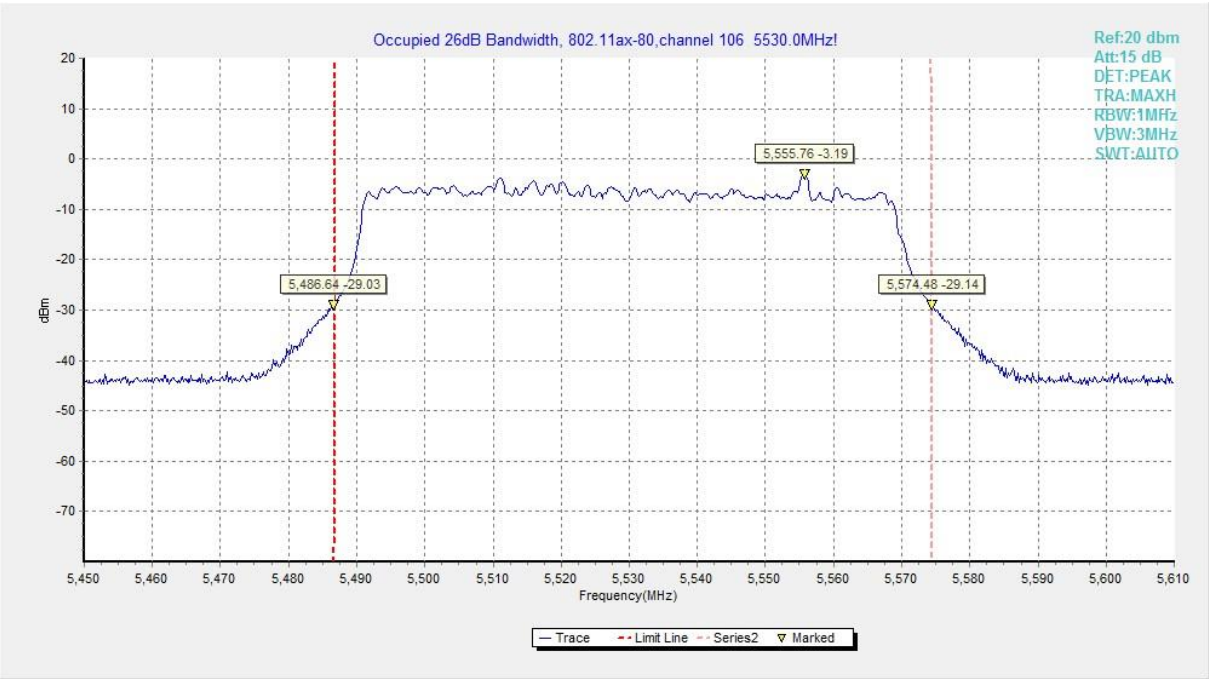

Fig.31 Occupied 26dB Bandwidth (802. 11ax-HE80, 5530MHz)

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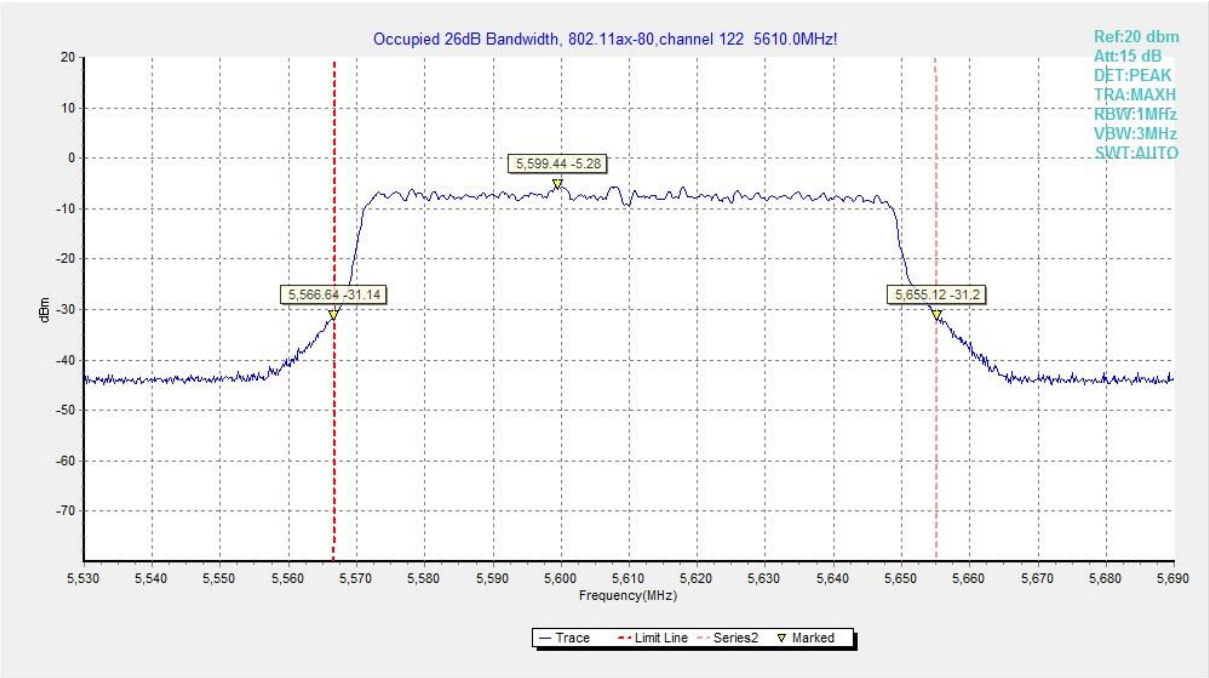

Fig.32 Occupied 26dB Bandwidth (802. 11ax-HE80, 5610MHz)

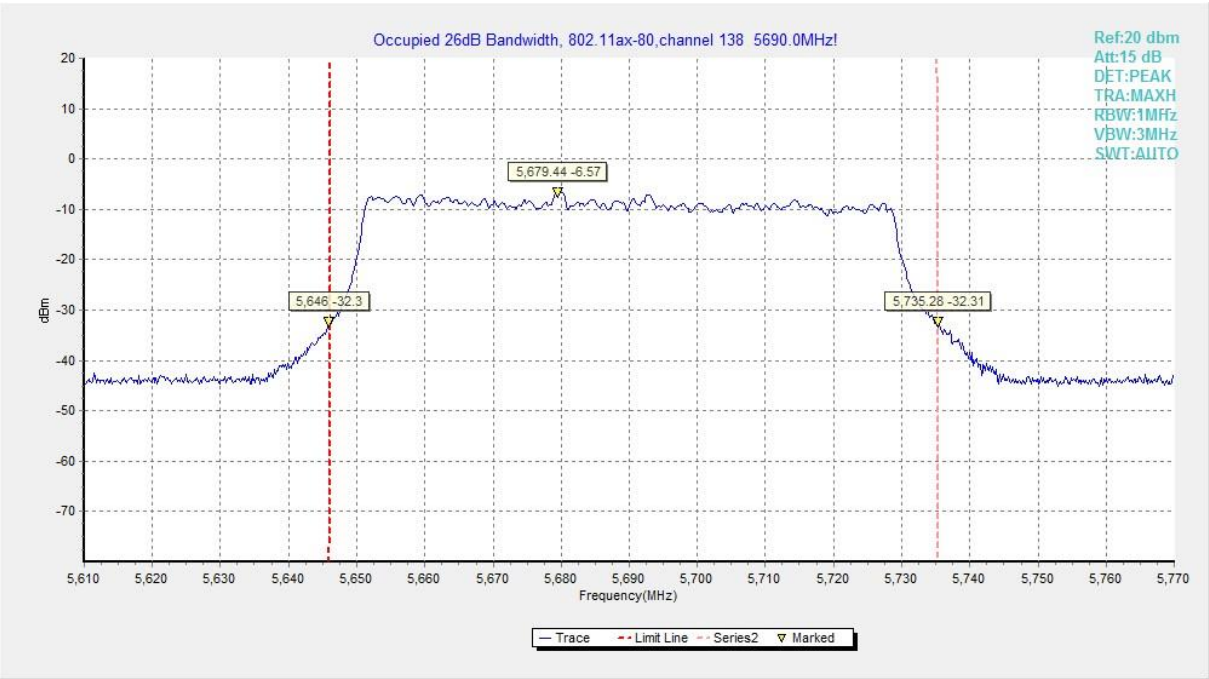

Fig.33 Occupied 26dB Bandwidth (802. 11ax-HE80, 5690MHz)

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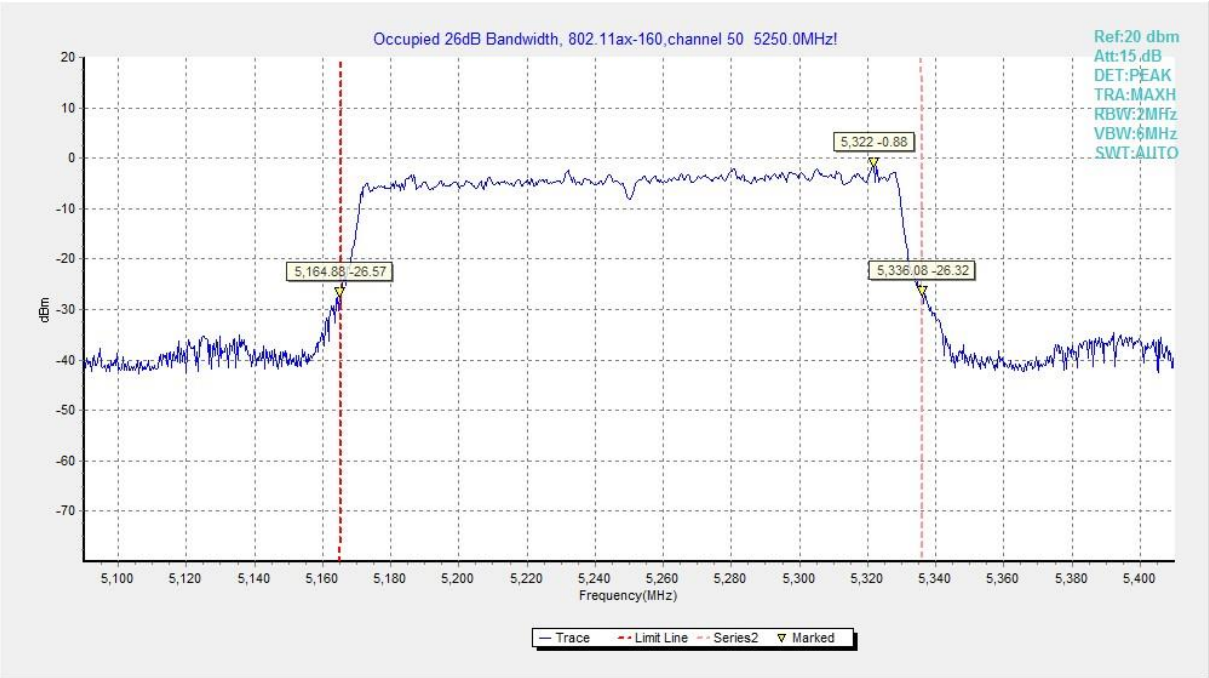

Fig.34 Occupied 26dB Bandwidth (802. 11ax-HE160, 5250MHz)

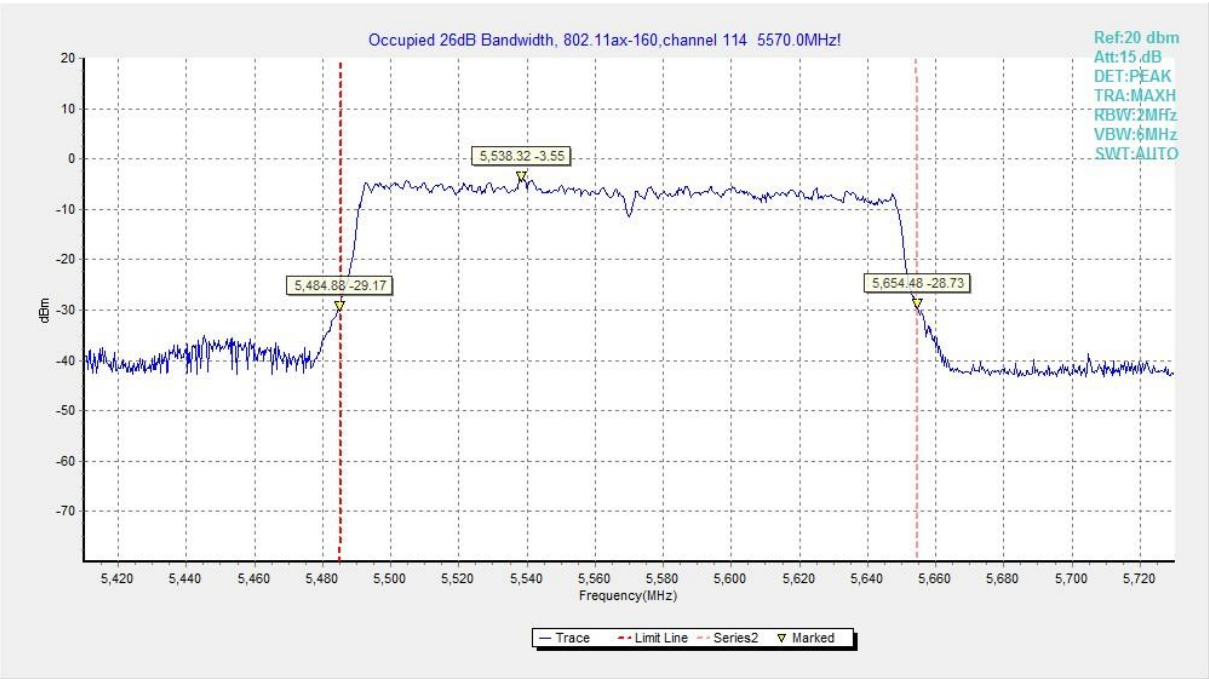

Fig.35 Occupied 26dB Bandwidth (802. 11ax-HE160, 5570MHz)

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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

Measurement Result:

Mode	Channel	Test Results	Conclusion
802.11a	5180 MHz	Fig.36	P
	5320 MHz	Fig.37	P
	5500 MHz	Fig.38	P
	5700 MHz	Fig.39	P
802.11n HT20	5180 MHz	Fig.40	P
	5320 MHz	Fig.41	P
	5500 MHz	Fig.42	P
	5700 MHz	Fig.43	P
802.11ac HT20	5180 MHz	Fig.44	P
	5320 MHz	Fig.45	P
	5500 MHz	Fig.46	P
	5700 MHz	Fig.47	P
802.11n HT40	5190 MHz	Fig.48	P
	5310 MHz	Fig.49	P
	5510 MHz	Fig.50	P
	5670 MHz	Fig.51	P
802.11ac HT40	5190 MHz	Fig.52	P
	5310 MHz	Fig.53	P
	5510 MHz	Fig.54	P
	5670 MHz	Fig.55	P
802.11ac HT80	5210MHz	Fig.56	P
	5290MHz	Fig.57	P
	5530MHz	Fig.58	P

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	5610MHz	Fig.59	P
802.11ac HT160	5250MHz	Fig.60	P
	5250MHz	Fig.61	P
	5570MHz	Fig.62	P
	5570MHz	Fig.63	P
802.11ax HT20	5180 MHz	Fig.64	P
	5320 MHz	Fig.65	P
	5500 MHz	Fig.66	P
	5700 MHz	Fig.67	P
802.11ax HT40	5190 MHz	Fig.68	P
	5310 MHz	Fig.69	P
	5510 MHz	Fig.70	P
	5670 MHz	Fig.71	P
802.11ax HT80	5210MHz	Fig.72	P
	5290MHz	Fig.73	P
	5530MHz	Fig.74	P
	5610MHz	Fig.75	P
802.11ax HT160	5250MHz	Fig.76	P
	5250MHz	Fig.77	P
	5570MHz	Fig.78	P
	5570MHz	Fig.79	P

Conclusion: PASS

Test graphs as below:

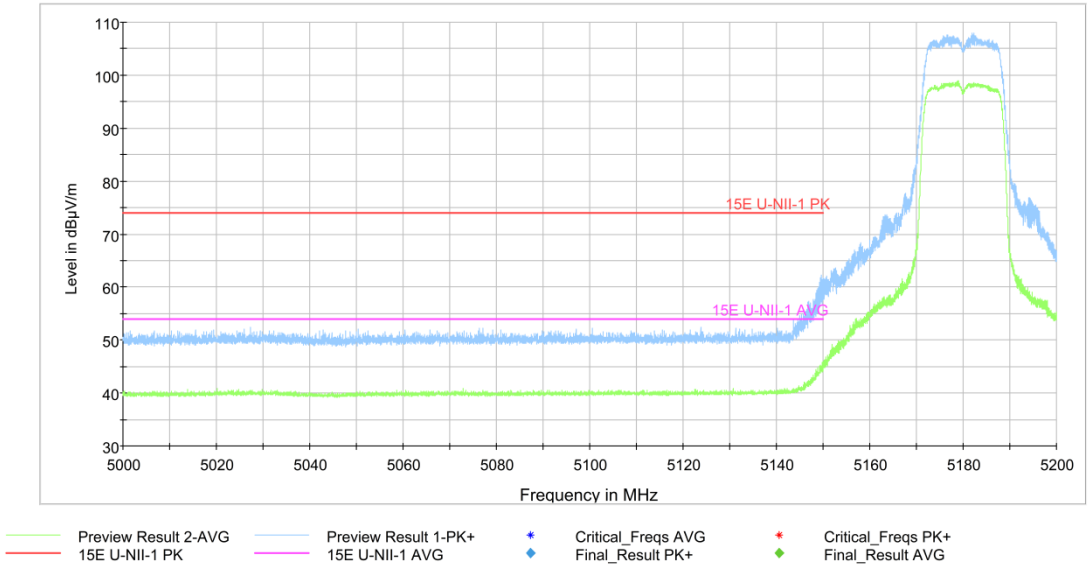

Fig.36 Band Edges (802.11a Ch36, 5180MHz)

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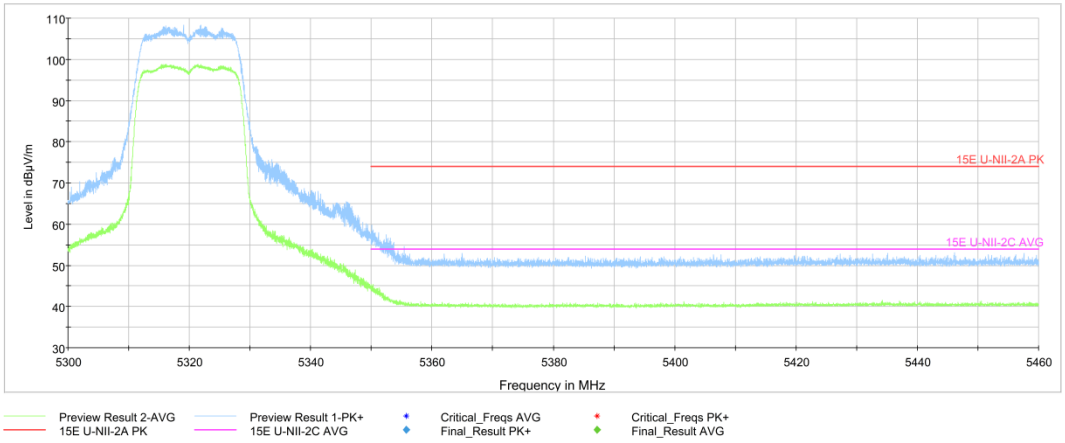

Fig.37 Band Edges (802.11a Ch64, 5320MHz)

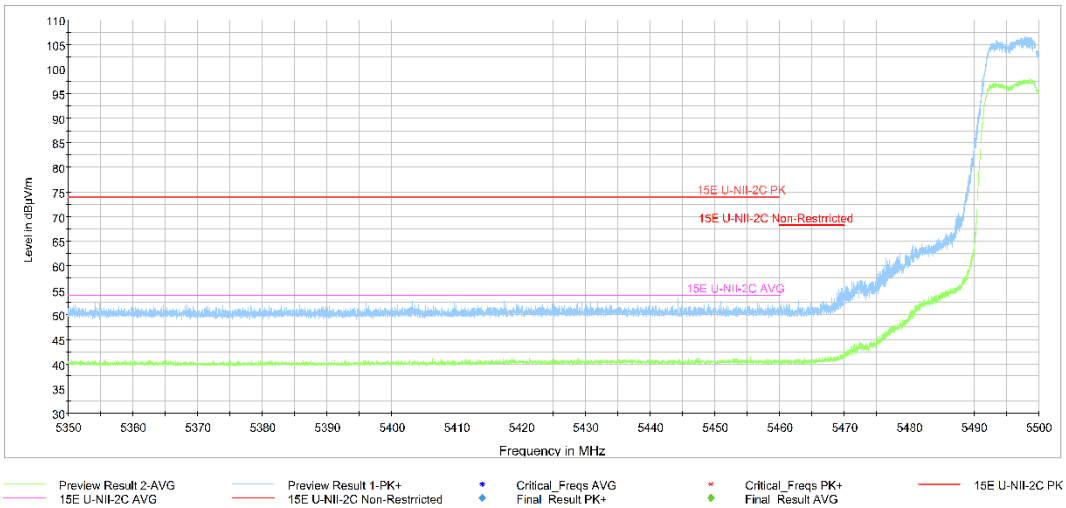

Fig.38 Band Edges (802.11a Ch100, 5500MHz)

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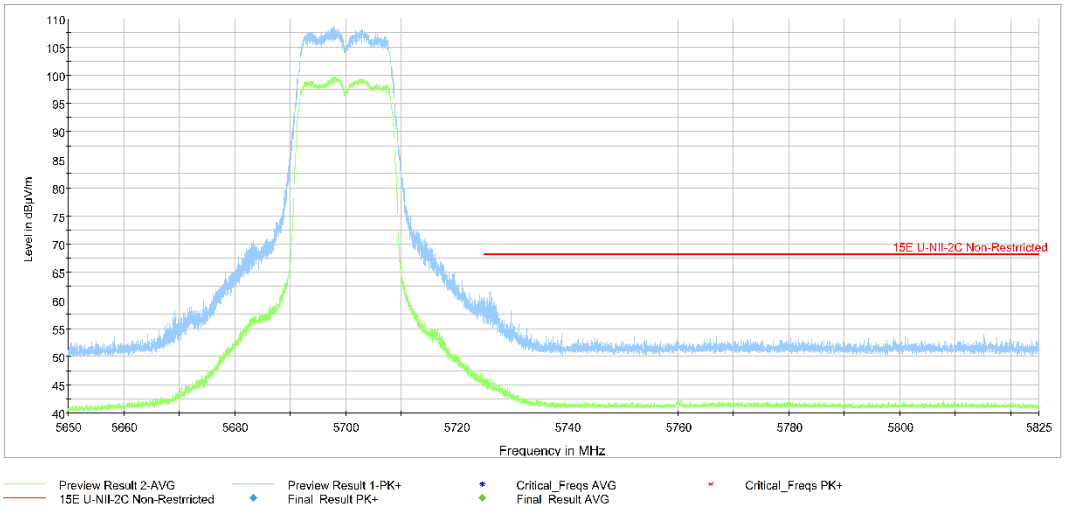

Fig.39 Band Edges (802.11a Ch140, 5700MHz)

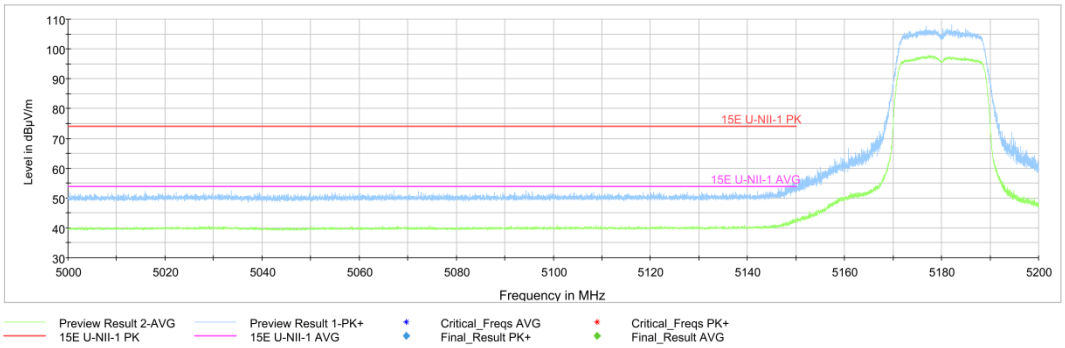

Fig.40 Band Edges (802.11n-HT20 Ch36, 5180MHz)

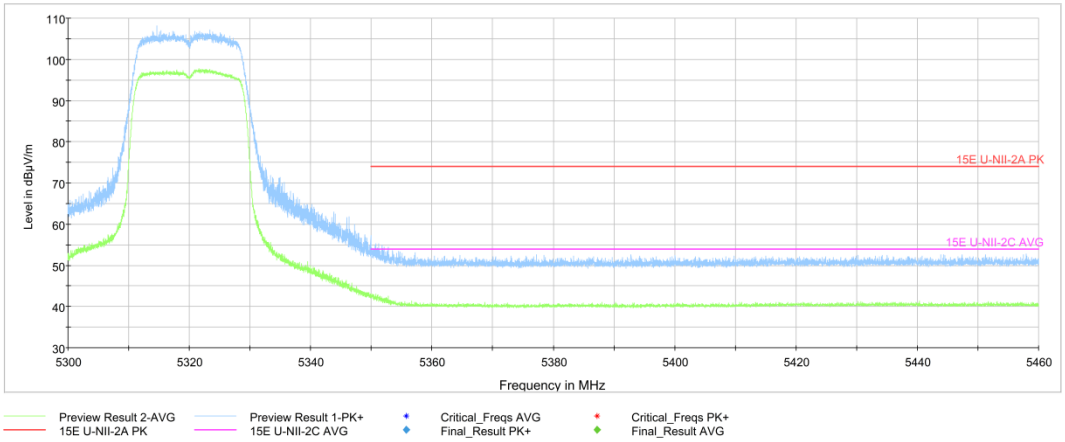

Fig.41 Band Edges (802.11n-HT20 Ch64, 5320MHz)

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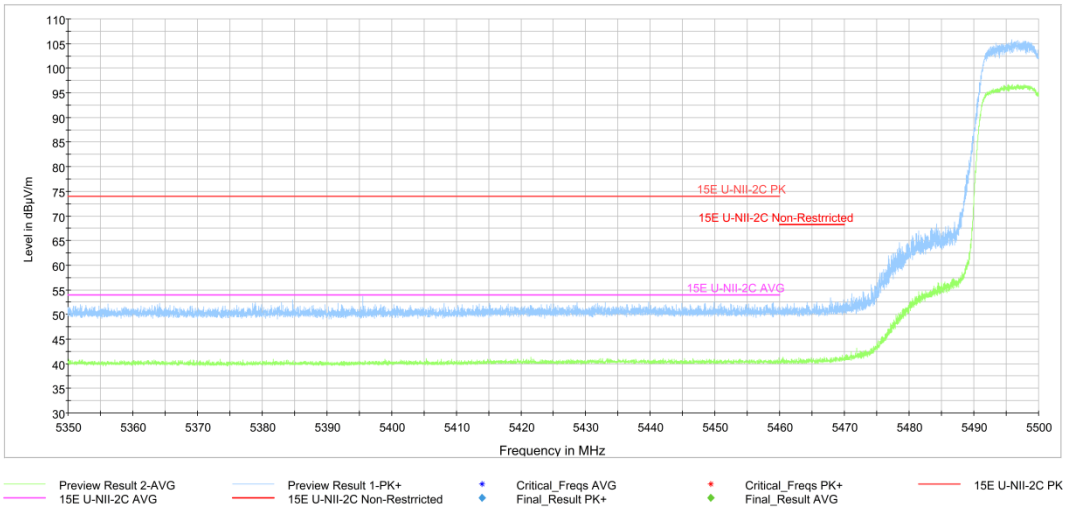

Fig.42 Band Edges (802.11n-HT20 Ch100, 5500MHz)

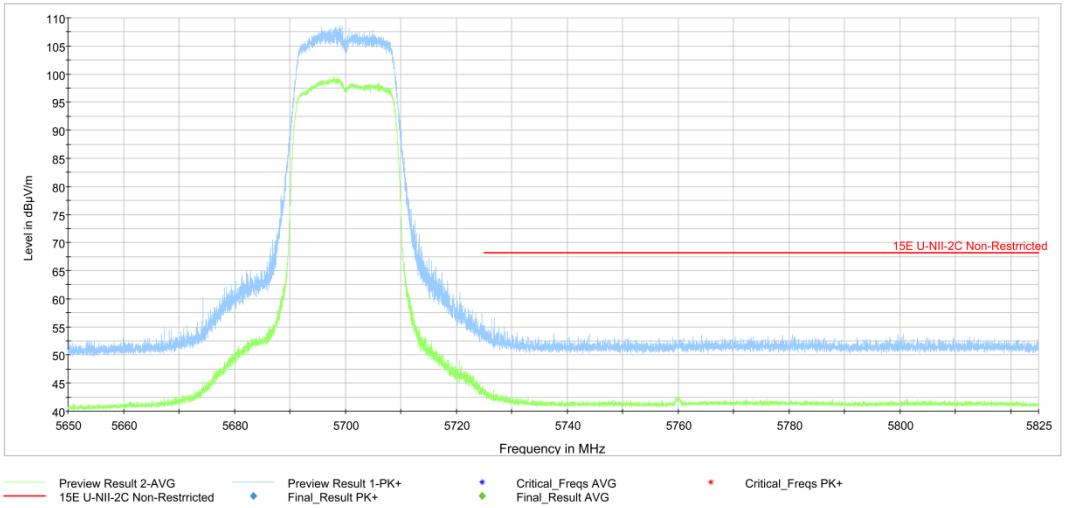

Fig.43 Band Edges (802.11n-HT20 Ch140, 5700MHz)

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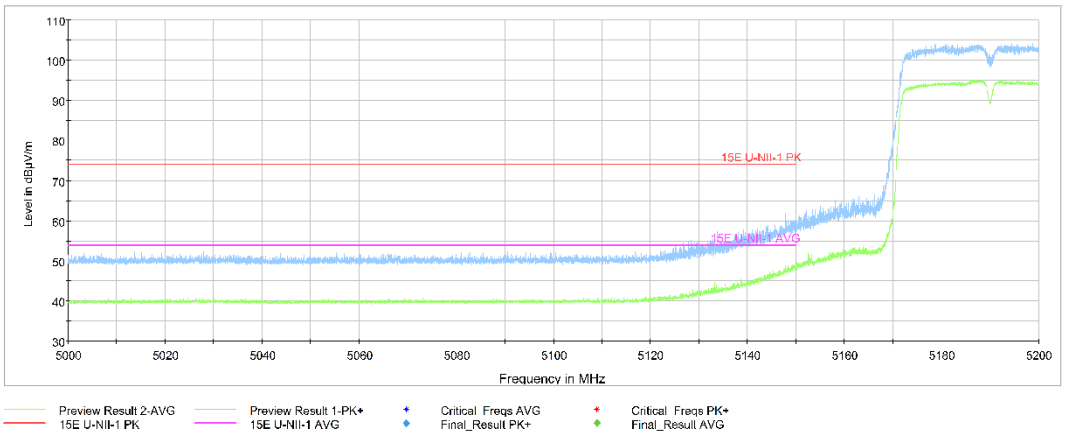

Fig.44 Band Edges (802.11n-HT40 Ch38, 5190MHz)

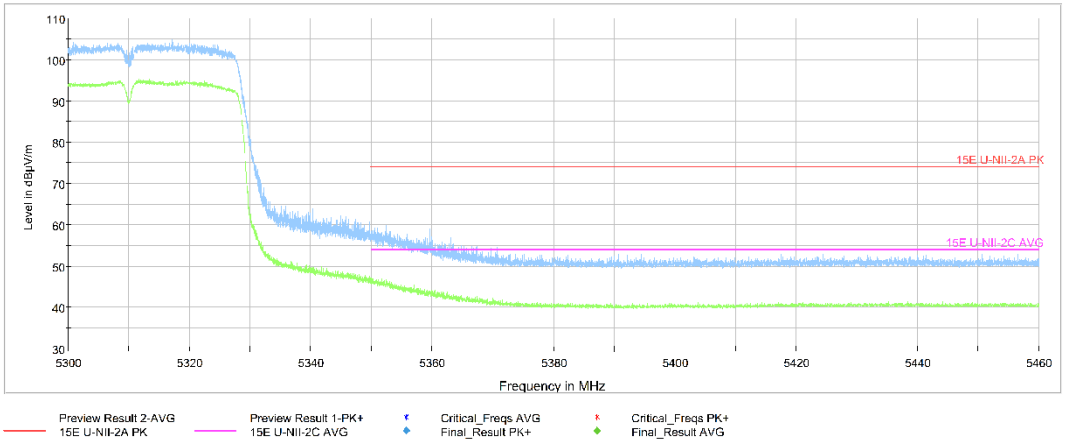

Fig.45 Band Edges (802.11n-HT40 Ch62, 5310MHz)

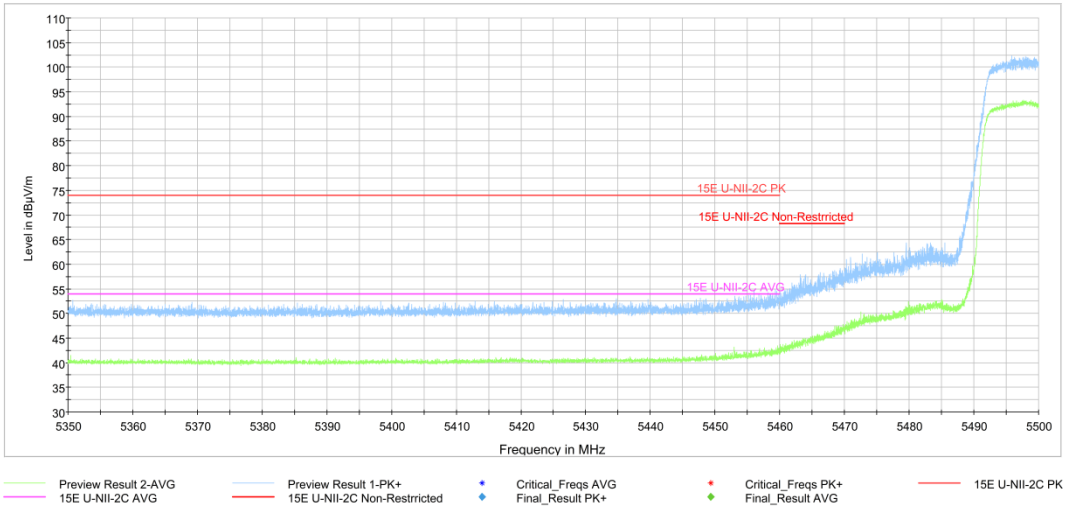

Fig.46 Band Edges (802.11n-HT40 Ch102, 5510MHz)

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