TESTING
NVLAP LAB CODE 600118-0

FCC PART 15
TEST REPORT
No.I23Z60023-IOT02

for

TCL Communication Ltd.

GSM/UMTS/LTE mobile phone

T610P

With

FCC ID: 2ACCJB198

Hardware Version: PIO

Software Version: 7GSA

Issued Date: 2023-02-02

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 CTTL.

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
I23Z60023-IOT02	Rev.0	1st edition	2023-02-02

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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

Conducted testing Location: CTTL(Huayuan North Road)

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

Radiated testing Location: CTTL(huayuan North Road)

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

1.3. Testing Environment

Normal Temperature: 15-35℃

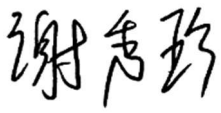
Relative Humidity: 20-75%

1.4. Project date

Testing Start Date: 2023-01-04

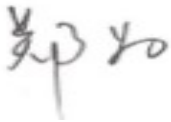
Testing End Date: 2023-01-31

1.5. Signature



Xie Xiuzhen

(Prepared this test report)



Zheng Wei

(Reviewed this test report)

Pang Shuai

(Approved this test report)

2. CLIENT INFORMATION

2.1. Applicant Information

Company Name:	TCL Communication Ltd.
Address:	5/F, Building 22E, 22 Science Park East Avenue, Hong Kong Science Park, Shatin, NT, Hong Kong
Contact:	Annie Jiang
Email:	nianxiang.jiang@tcl.com
Telephone:	+86 755 3661 1621
Fax:	/

2.2. Manufacturer Information

Company Name:	TCL Communication Ltd.
Address:	5/F, Building 22E, 22 Science Park East Avenue, Hong Kong Science Park, Shatin, NT, Hong Kong
Contact:	Annie Jiang
Email:	nianxiang.jiang@tcl.com
Telephone:	+86 755 3661 1621
Fax:	/

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

3.1. About EUT

Description	GSM/UMTS/LTE mobile phone
Model name	T610P
FCC ID	2ACCJB193
WLAN Frequency Band	ISM Bands: -5150MHz~5250MHz -5250MHz~5350MHz -5470MHz~5725MHz
Type of modulation	OFDM
Antenna	Integral Antenna
Voltage	3.87V

3.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version
UT04a(T610E)	/	05	7GS9
UT05a(T610E)	/	05	7GS9
UT19a(T610E)	/	05	7GS9
UT07a(T610P)	352422290200096/ 352422290200021	PIO	7GSA
UT14a(T610P)	352422290200211/ 352422290200229	PIO	7GSA

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

UT14a is used for Conduction test, UT07a is used for Radiation test.

3.3. Internal Identification of AE used during the test

AE ID*	Description	SN
AE1	Battery	/
AE2	Charger	/
AE3	USB Cable	/

AE1

Model	TLp049C8
Manufacturer	Dongguan Ganfeng Electronics Co., LTD
Capacity	4900mAh
Nominal Voltage	3.87V

AE2

Model	YJC018R-US
Manufacturer	Dongguan YingJu Power Co., Ltd.

AE3

Model	JWUB1520-M01R
Manufacturer	Huizhou Juwei 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 GSM/UMTS/LTE mobile phone with integrated 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	2021
ANSI C63.10	Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz	2013
UNII: KDB 789033 D02	General U-NII Test Procedures New Rules v02r01	2017-12

5. LABORATORY ENVIRONMENT

Conducted RF performance testing is performed in shielding room.

EMC performance testing is performed in Semi-anechoic chamber.

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	/	**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	/	**BR**
Frequency Stability	15.407	/	**BR**
99% Occupied bandwidth	/	/	**BR**
Transmit Power Control	15.407	/	**BR**
AC Powerline Conducted Emission	15.107, 15.207	/	**BR**

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
BR	BR Re-use test data from basic model report.

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.

The Equipment Under Test (EUT) model T610P (FCC ID: 2ACCJB198) is a variant product of T610E (FCC ID: 2ACCJB193), according to the declaration of changes provided by the applicant and FCC KDB publication 484596 D01, except power, Band Edges Compliance-Radiated and Transmitter Spurious Emission-Radiated,other results are derived from test report I22Z62079-IOT03.

For detail differences between two models please refer the Declaration of Changes document.

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°C
Voltage	3.87V
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	2023-05-15
2	Test Receiver	ESCI	100766	Rohde & Schwarz	1 year	2023-03-21
3	LISN	ESH2-Z5	829991/012	Rohde & Schwarz	1 year	2023-06-29
4	Shielding Room	S81	/	ETS-Lindgren	/	/

Radiated emission test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Period	Calibration Due date
1	Test Receiver	ESW44	103015	R&S	1 year	2024-01-11
2	EMI Antenna	VULB 9163	01223	SCHWARZBECK	1 year	2023-07-25
3	EMI Antenna	3115	00167250	ETS-Lindgren	1 year	2023-06-20

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	5.15
1GHz ≤ f ≤18GHz	5.54
18GHz ≤ f ≤40GHz	5.26

8.6 AC Power-line Conducted Emission

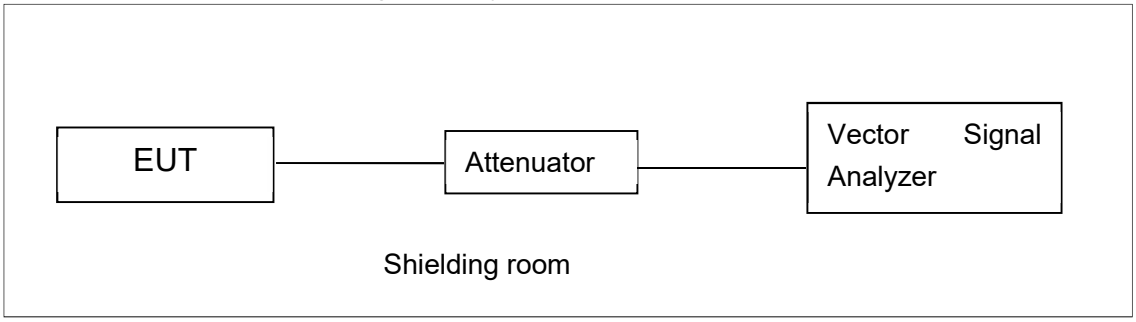
Measurement Uncertainty : 3.08,k=2

ANNEX A: MEASUREMENT RESULTS

A.1. Measurement Method

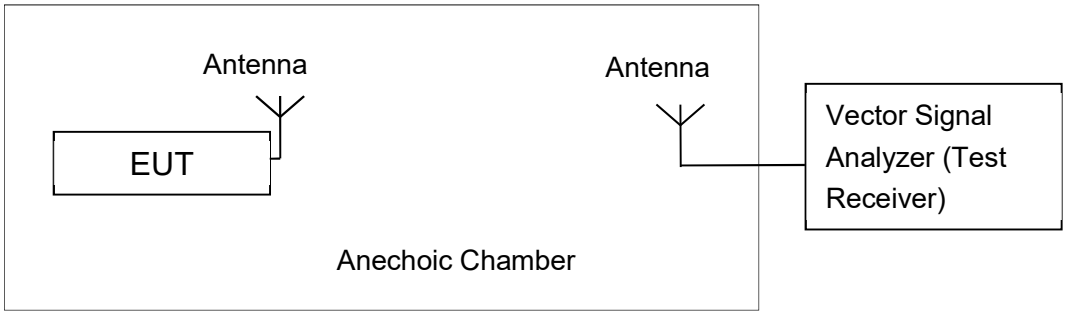
A.1.1. Conducted Measurements

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.

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:

EUT ID:04a/05a(T610E)

Antenna Gain: 1.5dBi

802.11a mode

Mode	Frequency	Test Result (dBm)							
		Data Rate (Mbps)							
		6	9	12	18	24	36	48	54
802.11a	5180MHz	13.43	/	/	/	/	/	/	/
	5200MHz	13.51	/	/	/	/	/	/	/
	5240MHz	13.55	/	/	/	/	/	/	/
	5260MHz	13.46	/	/	/	/	/	/	/
	5280MHz	13.48	/	/	/	/	/	/	/
	5320MHz	13.46	/	/	/	/	/	/	/
	5500MHz	13.78	/	/	/	/	/	/	/
	5580MHz	13.94	/	/	/	/	/	/	/
	5700MHz	13.65	/	/	/	/	/	/	/
	5720MHz	13.59	/	/	/	/	/	/	/

The data rate 6Mbps is selected as worst 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	13.29	/	/	/	/	/	/	/
	5200MHz	13.92	/	/	/	/	/	/	/
	5240MHz	13.68	/	/	/	/	/	/	/
	5260MHz	13.62	/	/	/	/	/	/	/
	5280MHz	13.53	/	/	/	/	/	/	/
	5320MHz	13.65	/	/	/	/	/	/	/
	5500MHz	14.75	/	/	/	/	/	/	/
	5580MHz	14.56	/	/	/	/	/	/	/
	5700MHz	14.35	/	/	/	/	/	/	/

	5720MHz	14.23	/	/	/	/	/	/	/

The data rate MCS0 is selected as worst condition, and the following cases are performed with 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	13.71	/	/	/	/	/	/	/	/
	5200MHz	14.14	/	/	/	/	/	/	/	/
	5240MHz	13.15	/	/	/	/	/	/	/	/
	5260MHz	13.23	/	/	/	/	/	/	/	/
	5280MHz	13.53	/	/	/	/	/	/	/	/
	5320MHz	13.33	/	/	/	/	/	/	/	/
	5500MHz	14.10	/	/	/	/	/	/	/	/
	5580MHz	13.94	/	/	/	/	/	/	/	/
	5700MHz	13.66	/	/	/	/	/	/	/	/
	5720MHz	14.03	/	/	/	/	/	/	/	/

The data rate MCS0 is selected as worst 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	13.57	/	/	/	/	/	/	/
	5230MHz	13.84	/	/	/	/	/	/	/
	5270MHz	14.01	/	/	/	/	/	/	/
	5310MHz	13.07	/	/	/	/	/	/	/
	5510MHz	13.75	/	/	/	/	/	/	/
	5550MHz	13.57	/	/	/	/	/	/	/
	5670MHz	13.51	/	/	/	/	/	/	/
	5710MHz	13.76	/	/	/	/	/	/	/

The data rate MCS0 is selected as worst 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	13.30	/	/	/	/	/	/	/	/	/
	5230MHz	13.32	/	/	/	/	/	/	/	/	/
	5270MHz	13.48	/	/	/	/	/	/	/	/	/
	5310MHz	13.04	/	/	/	/	/	/	/	/	/
	5510MHz	13.73	/	/	/	/	/	/	/	/	/
	5550MHz	13.76	/	/	/	/	/	/	/	/	/
	5670MHz	13.65	/	/	/	/	/	/	/	/	/
	5710MHz	13.93	/	/	/	/	/	/	/	/	/

The data rate MCS0 is selected as worst 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	13.43	/	/	/	/	/	/	/	/	/
	5290MHz	13.71	/	/	/	/	/	/	/	/	/
	5530MHz	14.10	/	/	/	/	/	/	/	/	/
	5610MHz	14.50	/	/	/	/	/	/	/	/	/
	5690MHz	13.74	/	/	/	/	/	/	/	/	/

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

Measurement results for variant model:

EUT ID:UT14a(T610P)

802.11a mode

Mode	Frequency	Test Result (dBm)							
		Data Rate (Mbps)							
		6	9	12	18	24	36	48	54
802.11a	5180MHz	14.17	/	/	/	/	/	/	/
	5200MHz	13.45	/	/	/	/	/	/	/
	5240MHz	13.45	/	/	/	/	/	/	/
	5260MHz	14.09	/	/	/	/	/	/	/
	5280MHz	14.06	/	/	/	/	/	/	/
	5320MHz	14.63	/	/	/	/	/	/	/
	5500MHz	14.08	/	/	/	/	/	/	/
	5580MHz	13.03	/	/	/	/	/	/	/

	5700MHz	13.93	/	/	/	/	/	/	/
	5720MHz	13.66	/	/	/	/	/	/	/

The data rate 6Mbps is selected as worst 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	14.00	/	/	/	/	/	/	/
	5200MHz	14.07	/	/	/	/	/	/	/
	5240MHz	14.60	/	/	/	/	/	/	/
	5260MHz	14.11	/	/	/	/	/	/	/
	5280MHz	14.52	/	/	/	/	/	/	/
	5320MHz	14.31	/	/	/	/	/	/	/
	5500MHz	14.99	/	/	/	/	/	/	/
	5580MHz	14.29	/	/	/	/	/	/	/
	5700MHz	14.67	/	/	/	/	/	/	/
	5720MHz	14.31	/	/	/	/	/	/	/

The data rate MCS0 is selected as worst condition, and the following cases are performed with 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	13.79	/	/	/	/	/	/	/	/
	5200MHz	14.01	/	/	/	/	/	/	/	/
	5240MHz	14.49	/	/	/	/	/	/	/	/
	5260MHz	14.29	/	/	/	/	/	/	/	/
	5280MHz	14.70	/	/	/	/	/	/	/	/
	5320MHz	14.33	/	/	/	/	/	/	/	/
	5500MHz	14.87	/	/	/	/	/	/	/	/
	5580MHz	14.16	/	/	/	/	/	/	/	/
	5700MHz	14.75	/	/	/	/	/	/	/	/
	5720MHz	14.08	/	/	/	/	/	/	/	/

The data rate MCS0 is selected as worst 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	5190MHz	13.66	/	/	/	/	/	/	/

(HT40)	5230MHz	14.20	/	/	/	/	/	/	/
	5270MHz	14.38	/	/	/	/	/	/	/
	5310MHz	14.23	/	/	/	/	/	/	/
	5510MHz	14.49	/	/	/	/	/	/	/
	5550MHz	14.35	/	/	/	/	/	/	/
	5670MHz	14.11	/	/	/	/	/	/	/
	5710MHz	13.81	/	/	/	/	/	/	/

The data rate MCS0 is selected as worst 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	13.83	/	/	/	/	/	/	/	/	/
	5230MHz	14.43	/	/	/	/	/	/	/	/	/
	5270MHz	14.37	/	/	/	/	/	/	/	/	/
	5310MHz	13.82	/	/	/	/	/	/	/	/	/
	5510MHz	14.48	/	/	/	/	/	/	/	/	/
	5550MHz	14.31	/	/	/	/	/	/	/	/	/
	5670MHz	14.03	/	/	/	/	/	/	/	/	/
	5710MHz	13.78	/	/	/	/	/	/	/	/	/

The data rate MCS0 is selected as worst 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	13.40	/	/	/	/	/	/	/	/	/
	5290MHz	14.08	/	/	/	/	/	/	/	/	/
	5530MHz	14.53	/	/	/	/	/	/	/	/	/
	5610MHz	13.75	/	/	/	/	/	/	/	/	/
	5690MHz	14.32	/	/	/	/	/	/	/	/	/

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

The duty cycle of all mode are 100%

Conclusion: PASS

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	2.34	P
	5200 MHz	2.56	P
	5240 MHz	2.33	P
	5260 MHz	1.95	P
	5280 MHz	2.30	P
	5320 MHz	2.39	P
	5500 MHz	3.07	P
	5580 MHz	3.27	P
	5700 MHz	3.24	P
	5720 MHz	3.38	P
802.11n HT20	5180 MHz	2.30	P
	5200 MHz	1.62	P
	5240 MHz	2.21	P
	5260 MHz	2.09	P
	5280 MHz	1.75	P
	5320 MHz	2.10	P
	5500 MHz	3.03	P
	5580 MHz	2.96	P
	5700 MHz	2.90	P
	5720 MHz	2.63	P
802.11n HT40	5190 MHz	-0.56	P
	5230 MHz	-0.80	P
	5270 MHz	-0.56	P
	5310 MHz	-0.87	P
	5510 MHz	-0.27	P
	5550 MHz	-0.37	P
	5670 MHz	-0.19	P
	5710 MHz	0.25	P
802.11ac HT80	5210MHz	-4.47	P
	5290MHz	-3.72	P
	5530MHz	-3.60	P

	5610MHz	-3.16	P
	5690MHz	-3.19	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)		conclusion
802.11a	5180 MHz	Fig.1	20.65	P
	5200 MHz	Fig.2	20.55	P
	5240 MHz	Fig.3	20.75	P
	5260 MHz	Fig.4	20.60	P
	5280 MHz	Fig.5	20.70	P
	5320 MHz	Fig.6	20.45	P
	5500 MHz	Fig.7	20.55	P
	5580 MHz	Fig.8	20.65	P
	5700 MHz	Fig.9	20.70	P
	5720 MHz	Fig.10	20.70	P
802.11n HT20	5180 MHz	Fig.11	21.00	P
	5200 MHz	Fig.12	20.85	P
	5240 MHz	Fig.13	20.80	P
	5260 MHz	Fig.14	20.85	P
	5280 MHz	Fig.15	20.80	P
	5320 MHz	Fig.16	20.95	P
	5500 MHz	Fig.17	20.80	P
	5580 MHz	Fig.18	20.90	P
	5700 MHz	Fig.19	20.90	P
	5720 MHz	Fig.20	20.90	P
802.11n HT40	5190 MHz	Fig.21	40.88	P
	5230 MHz	Fig.22	41.04	P
	5270 MHz	Fig.23	40.88	P
	5310 MHz	Fig.24	41.12	P
	5510 MHz	Fig.25	40.96	P
	5550 MHz	Fig.26	40.96	P

	5670 MHz	Fig.27	41.04	P
	5710 MHz	Fig.28	41.04	P
802.11ac HT80	5210MHz	Fig.29	81.28	P
	5290MHz	Fig.30	81.28	P
	5530MHz	Fig.31	81.44	P
	5610MHz	Fig.32	81.44	P
	5690MHz	Fig.33	81.28	P

Conclusion: PASS

Test graphs as below:

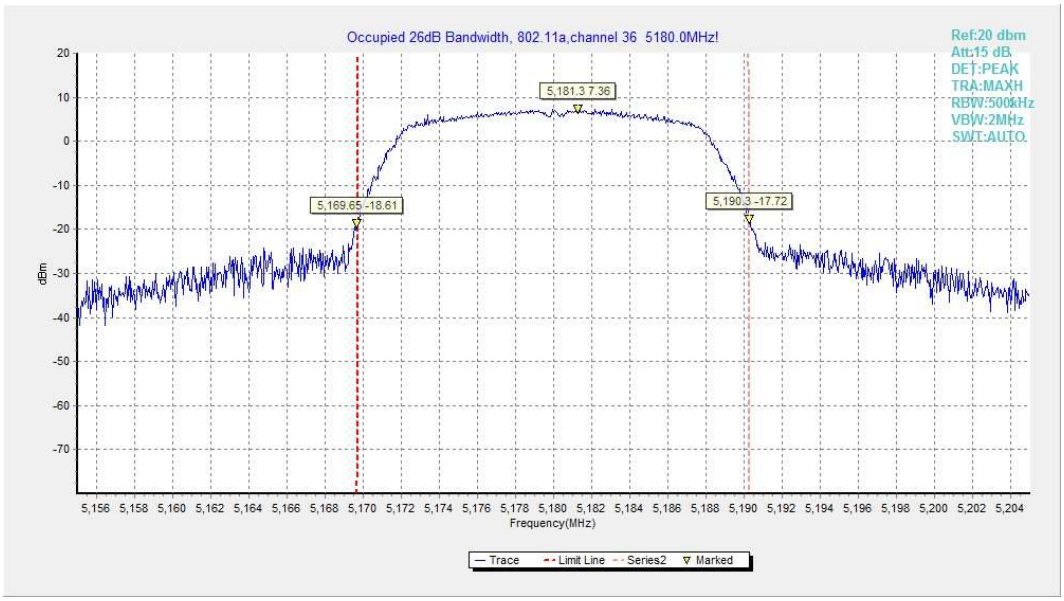


Fig.1 Occupied 26dB Bandwidth (802.11a, 5180MHz)

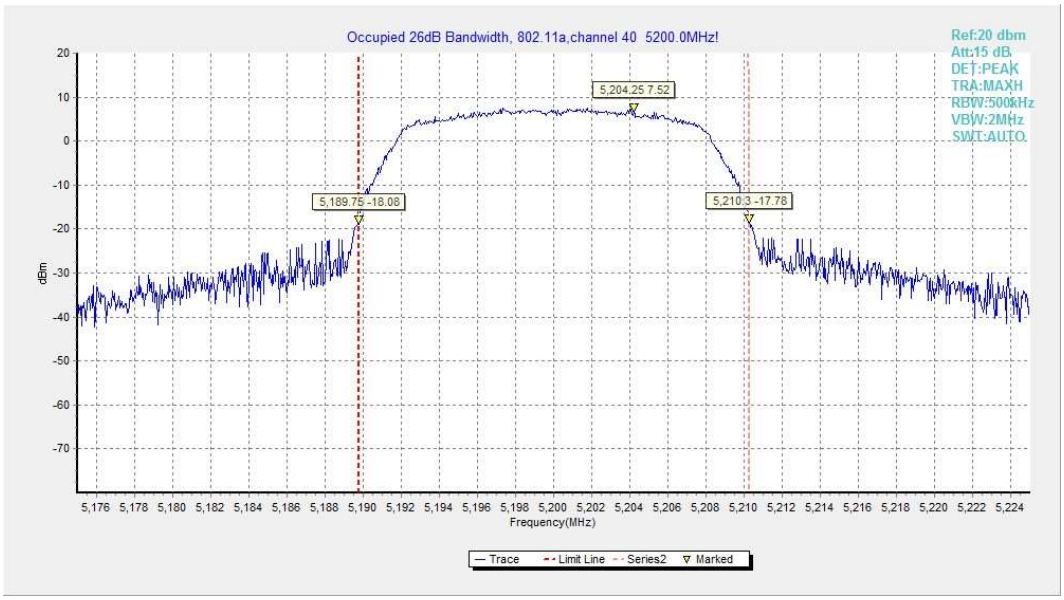


Fig.2 Occupied 26dB Bandwidth (802.11a, 5200MHz)

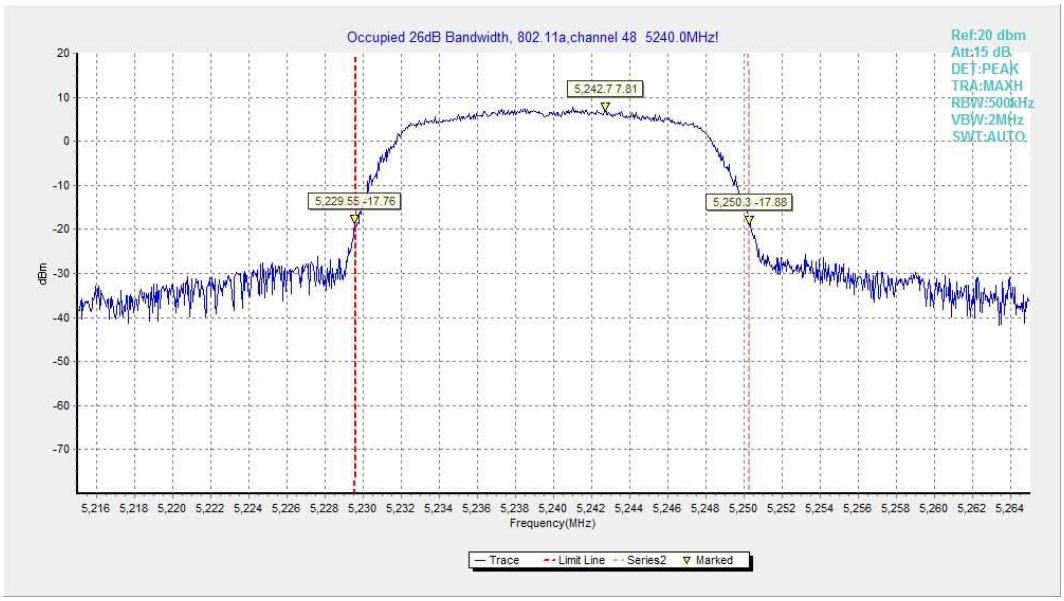


Fig.3 Occupied 26dB Bandwidth (802.11a, 5240MHz)

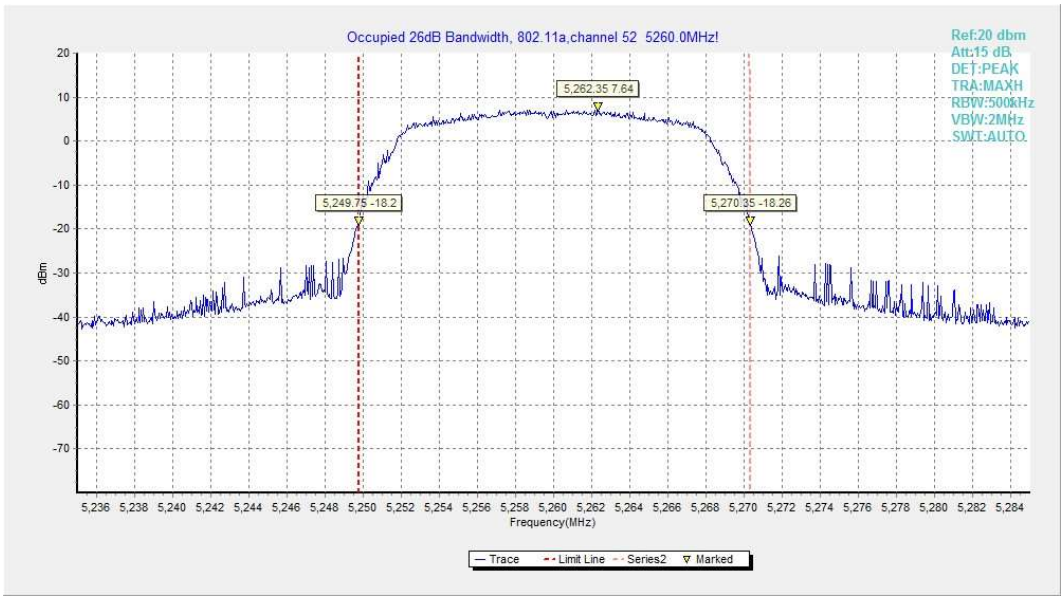


Fig.4 Occupied 26dB Bandwidth (802.11a, 5260MHz)

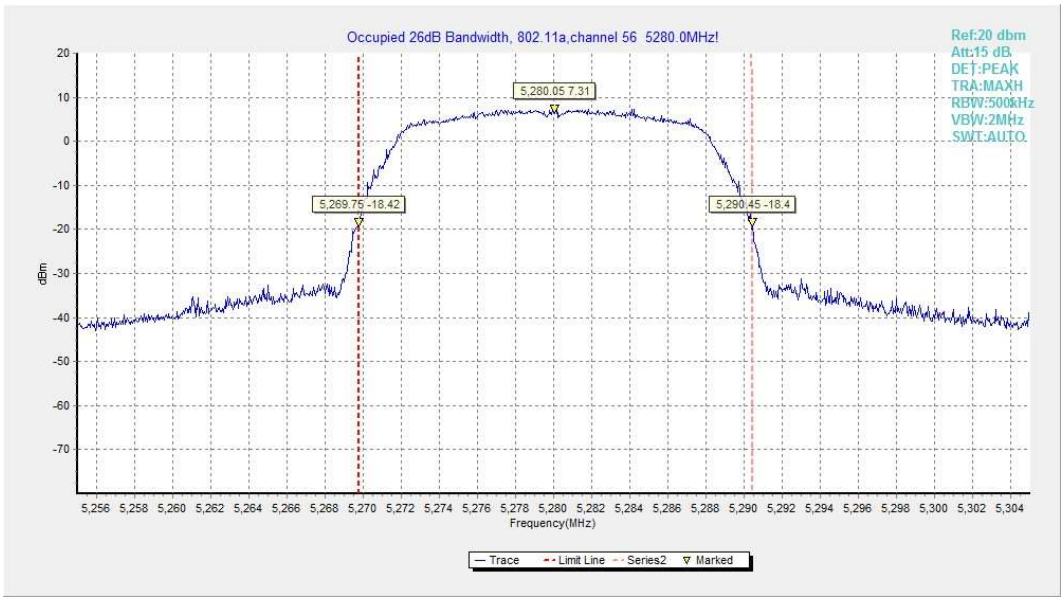


Fig.5 Occupied 26dB Bandwidth (802.11a, 5280MHz)

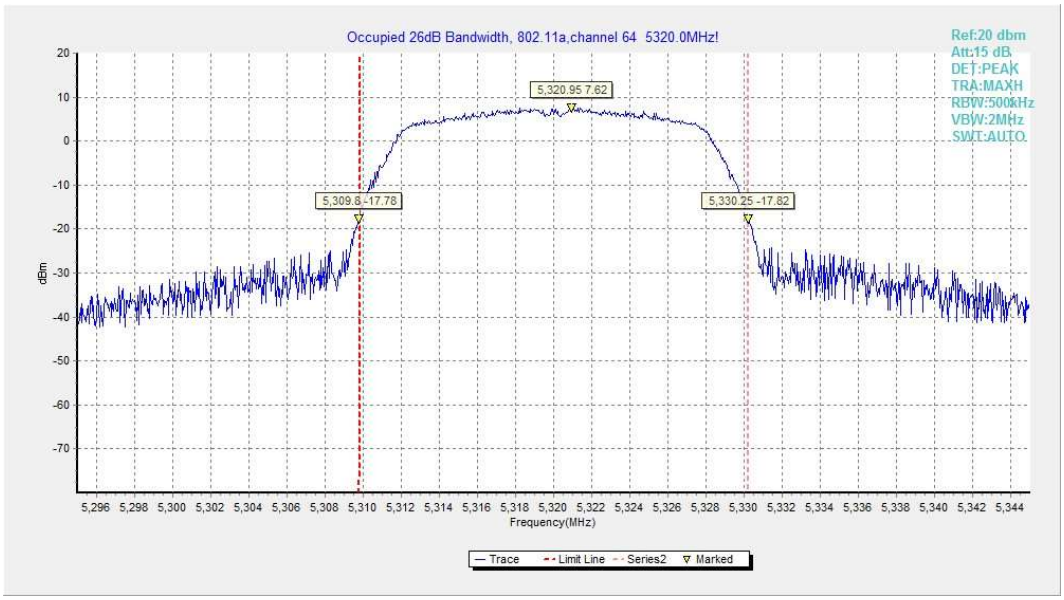


Fig.6 Occupied 26dB Bandwidth (802.11a, 5320MHz)

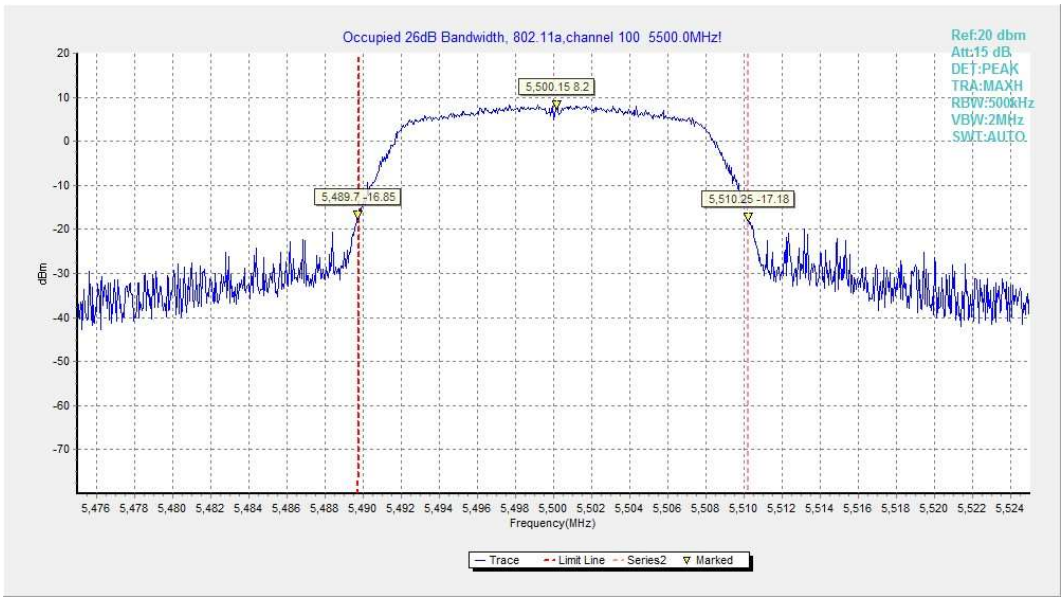


Fig.7 Occupied 26dB Bandwidth (802.11a, 5500MHz)

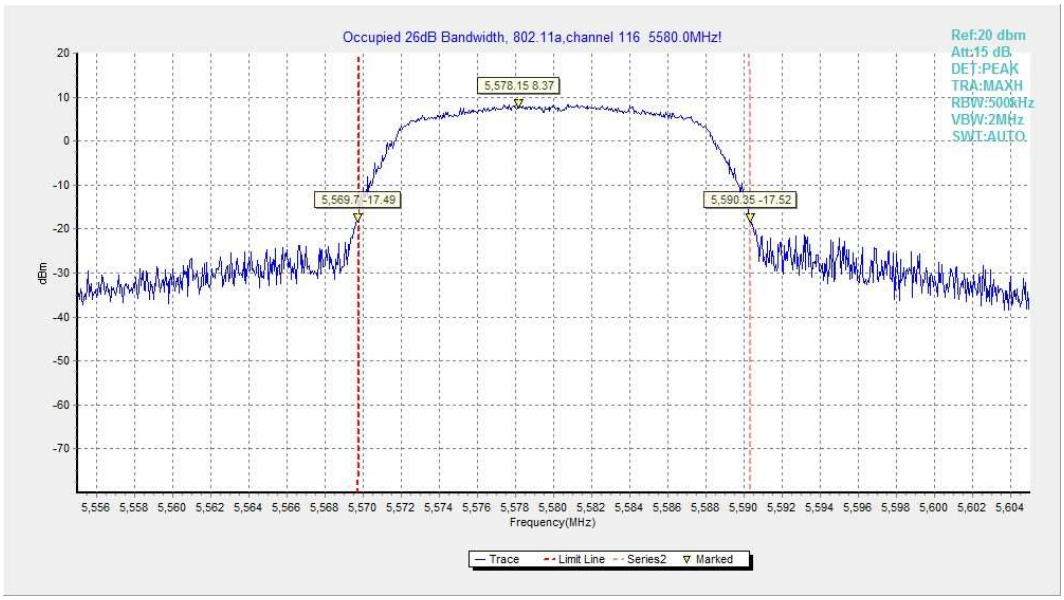


Fig.8 Occupied 26dB Bandwidth (802.11a, 5580MHz)

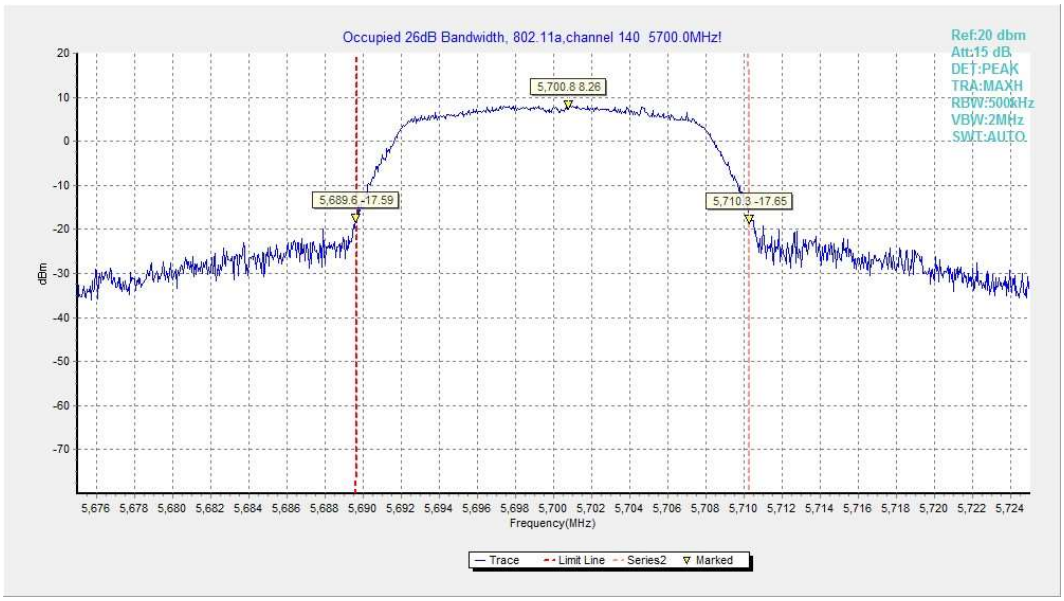


Fig.9 Occupied 26dB Bandwidth (802.11a, 5700MHz)

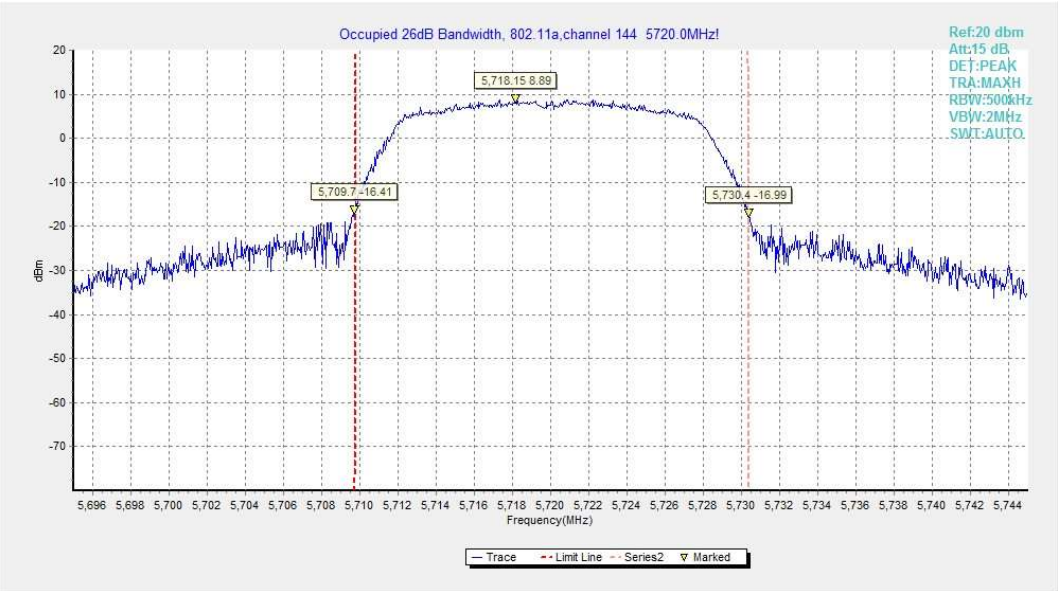


Fig.10 Occupied 26dB Bandwidth (802.11a, 5720MHz)

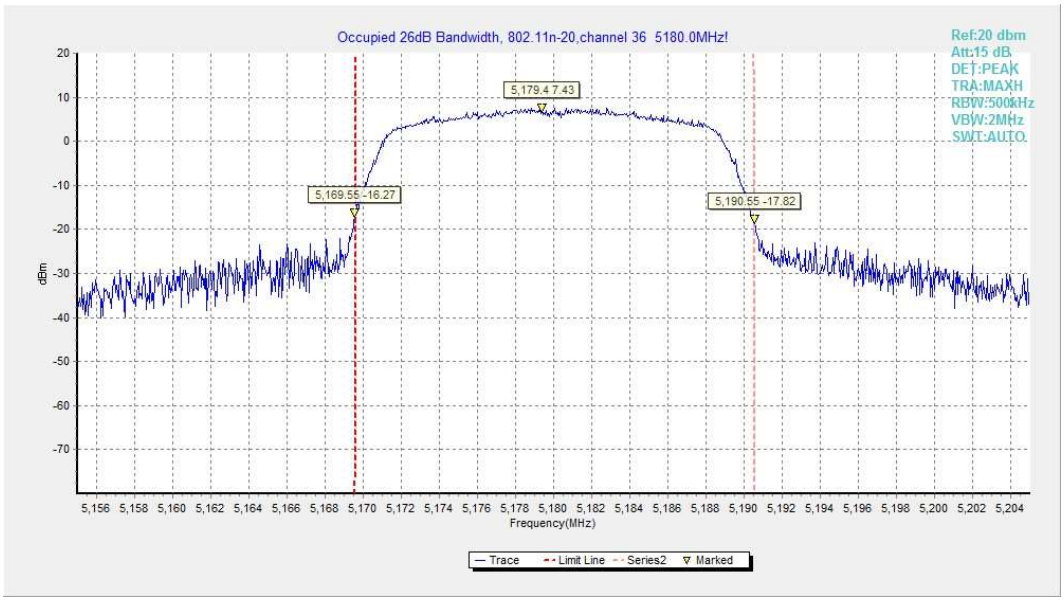


Fig.11 Occupied 26dB Bandwidth (802.11n-HT20, 5180MHz)

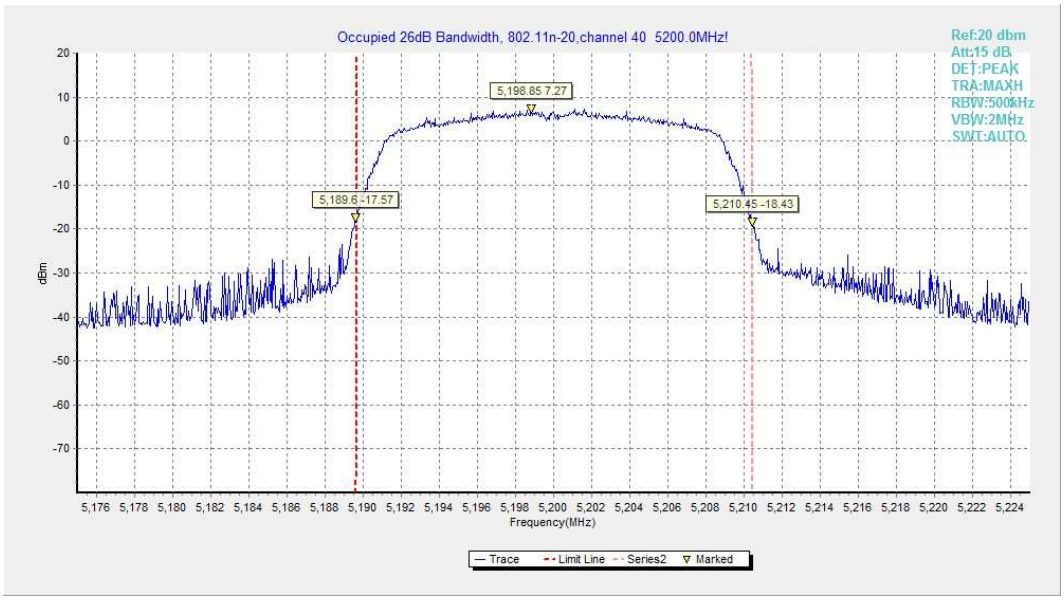


Fig.12 Occupied 26dB Bandwidth (802.11n-HT20, 5200MHz)

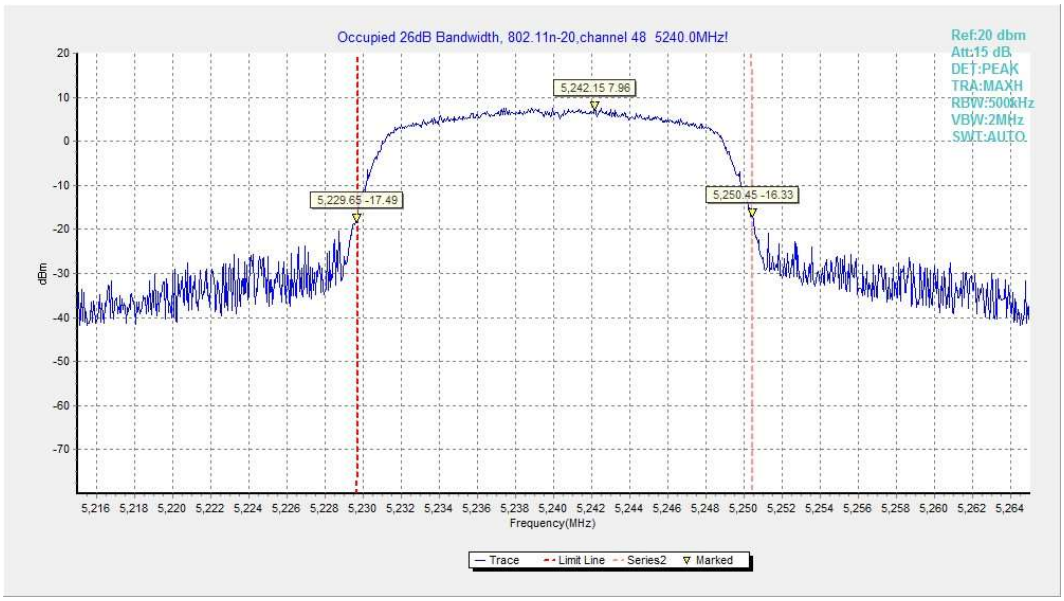


Fig.13 Occupied 26dB Bandwidth (802.11n-HT20, 5240MHz)

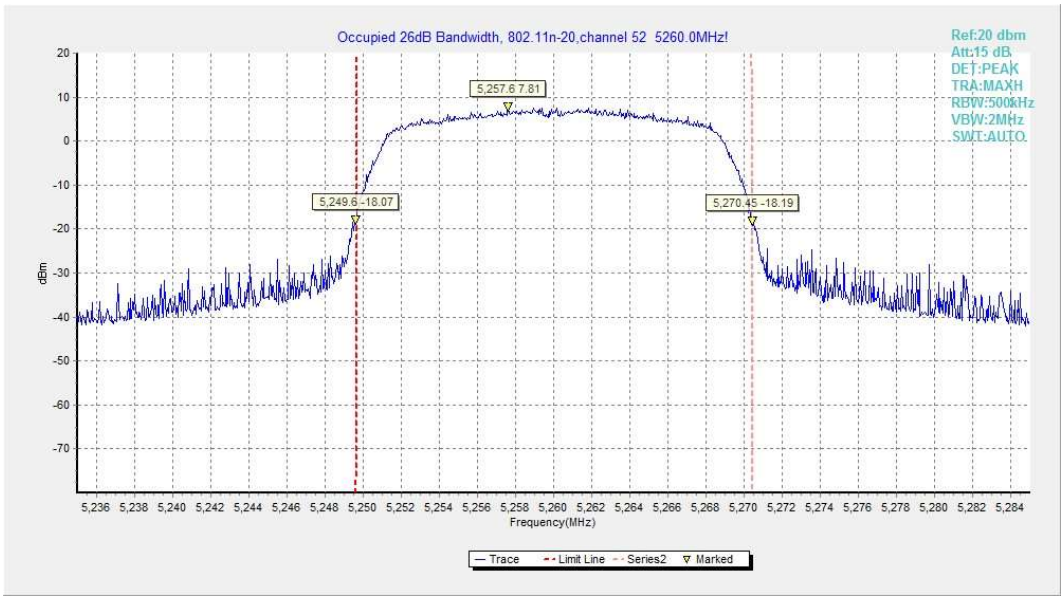


Fig.14 Occupied 26dB Bandwidth (802.11n-HT20, 5260MHz)

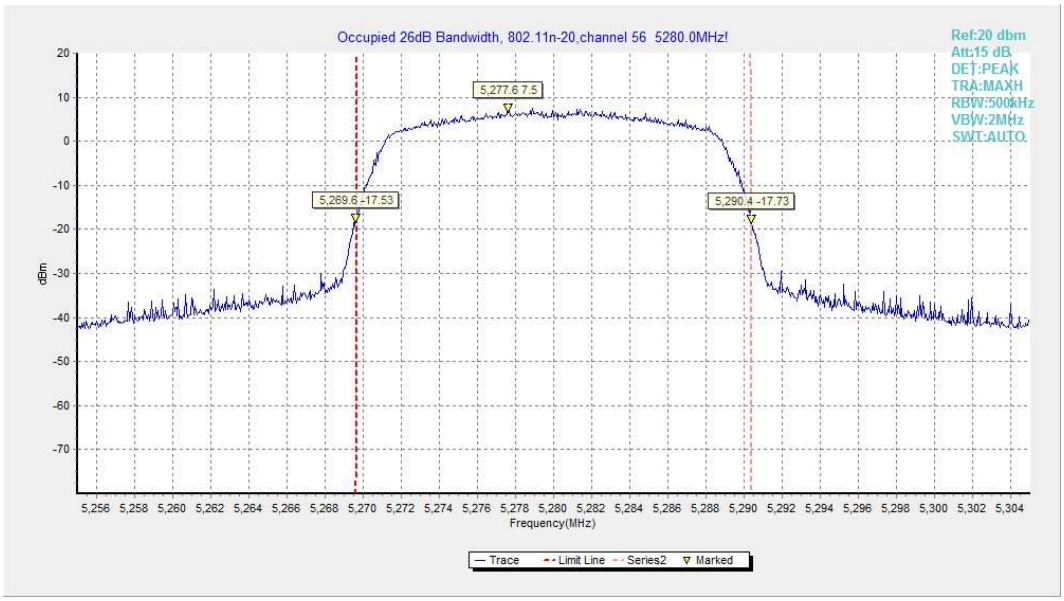


Fig.15 Occupied 26dB Bandwidth (802.11n-HT20, 5280MHz)

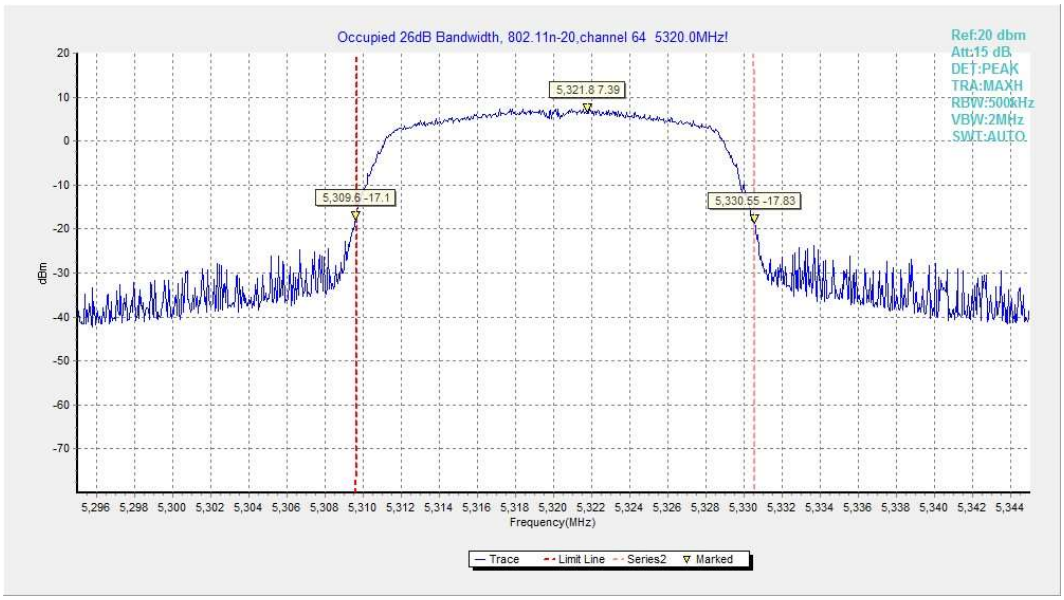


Fig.16 Occupied 26dB Bandwidth (802.11n-HT20, 5320MHz)

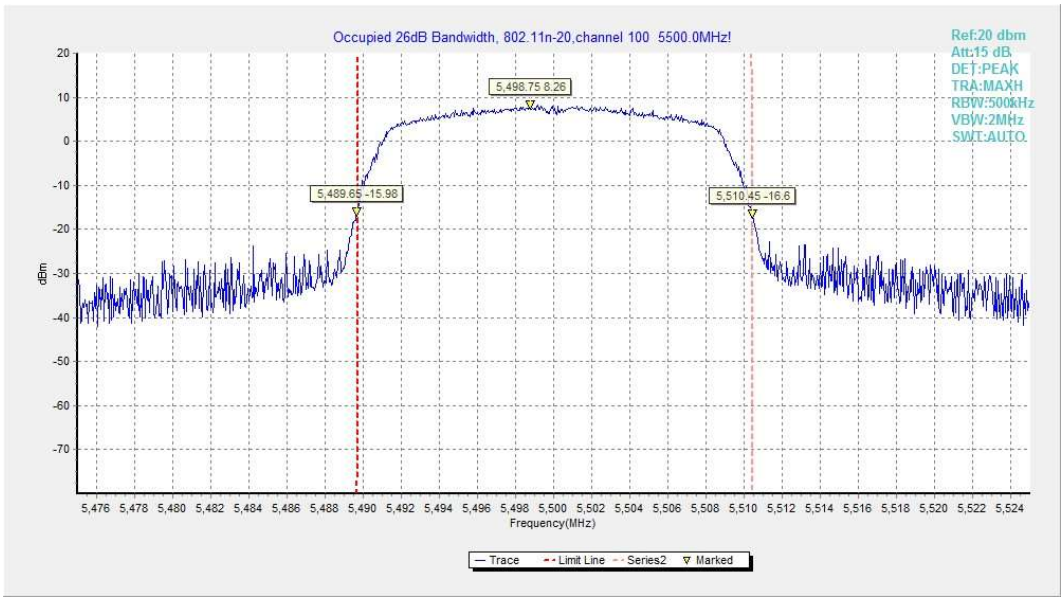


Fig.17 Occupied 26dB Bandwidth (802. 11n-HT20, 5500MHz)

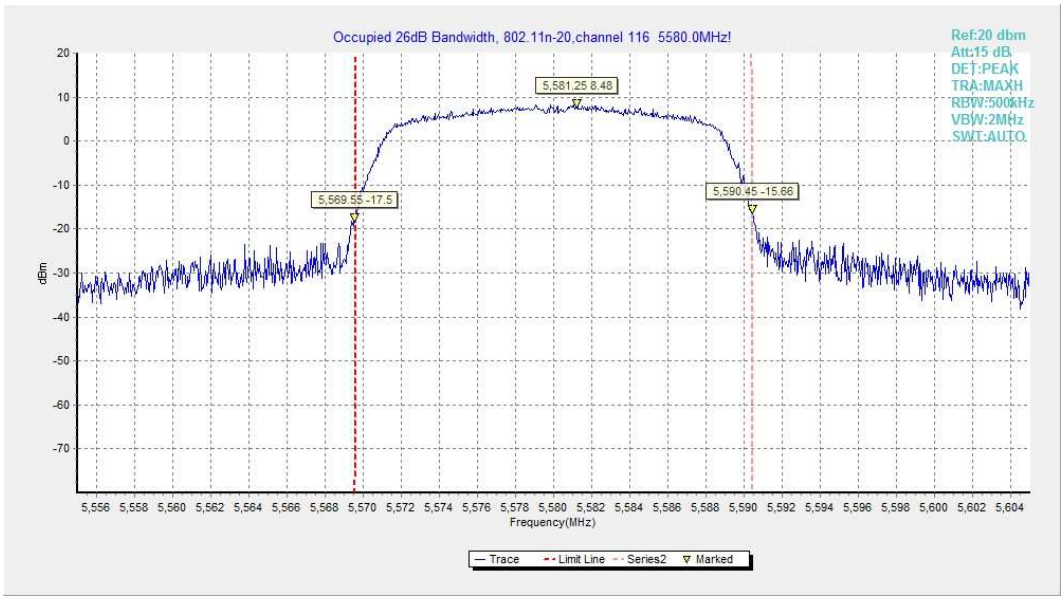


Fig.18 Occupied 26dB Bandwidth (802. 11n-HT20, 5580MHz)

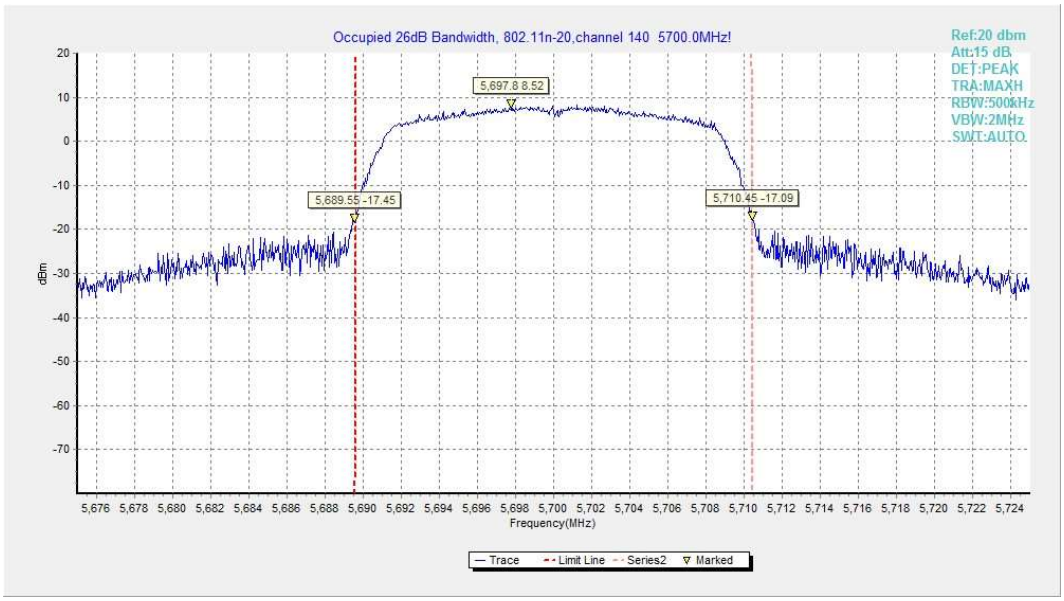


Fig.19 Occupied 26dB Bandwidth (802. 11n-HT20, 5700MHz)

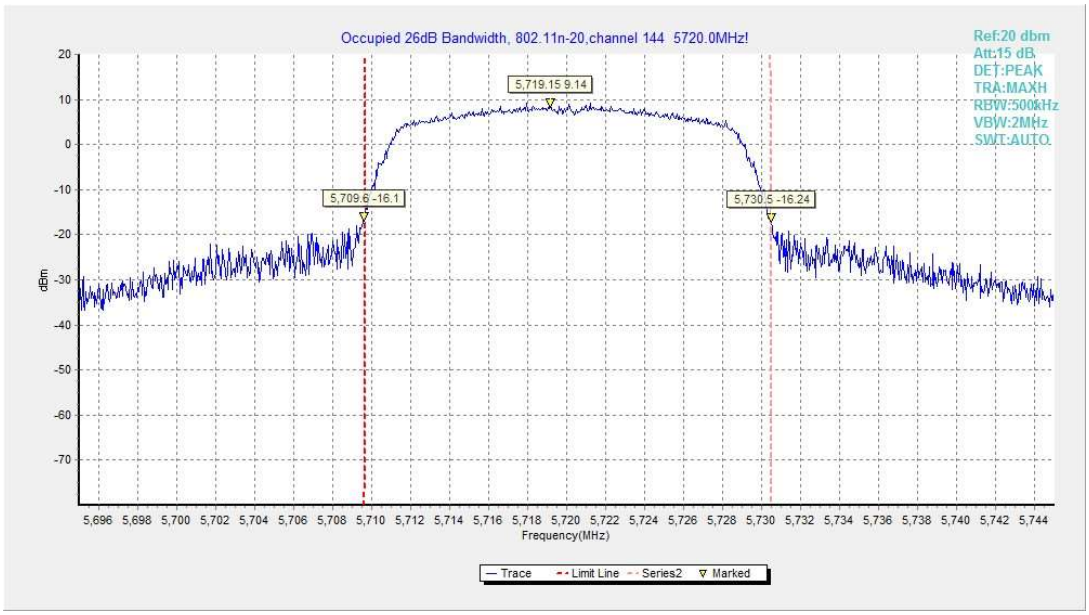


Fig.20 Occupied 26dB Bandwidth (802. 11n-HT20, 5720MHz)

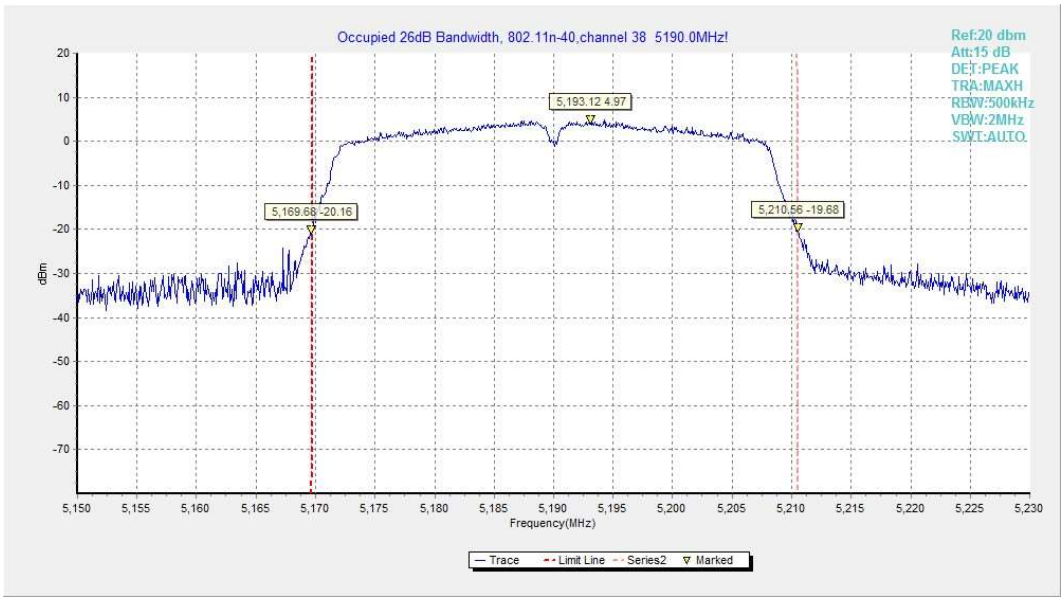


Fig.21 Occupied 26dB Bandwidth (802.11n-HT40, 5190MHz)

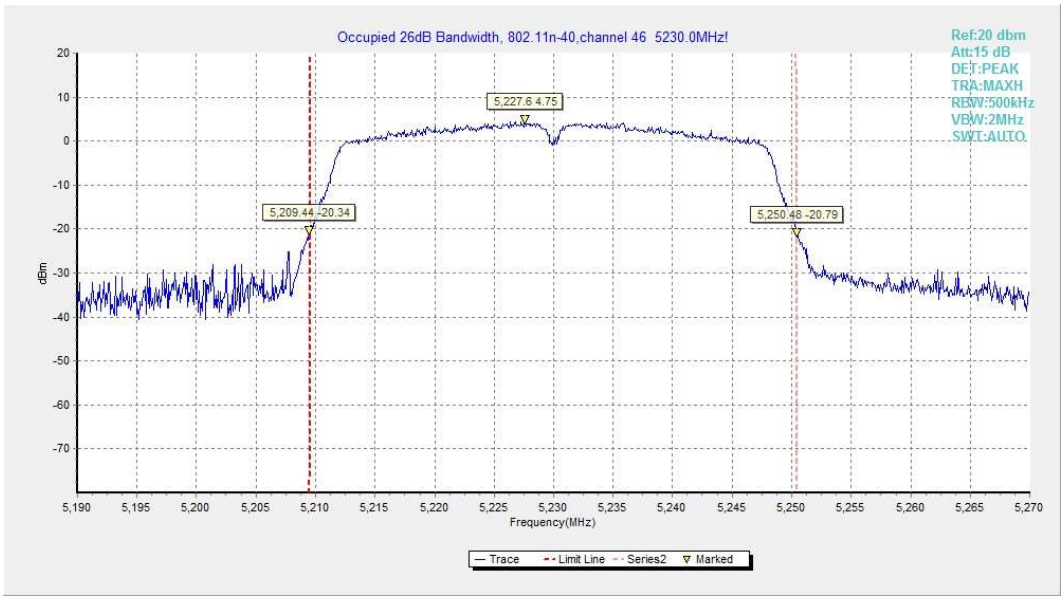


Fig.22 Occupied 26dB Bandwidth (802.11n-HT40, 5230MHz)

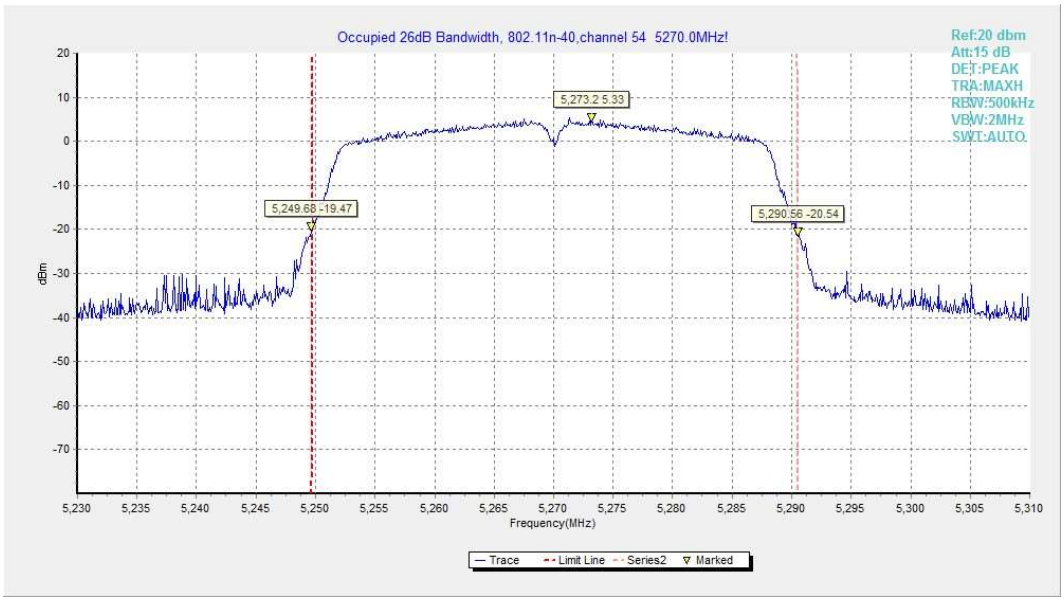


Fig.23 Occupied 26dB Bandwidth (802.11n-HT40, 5270MHz)

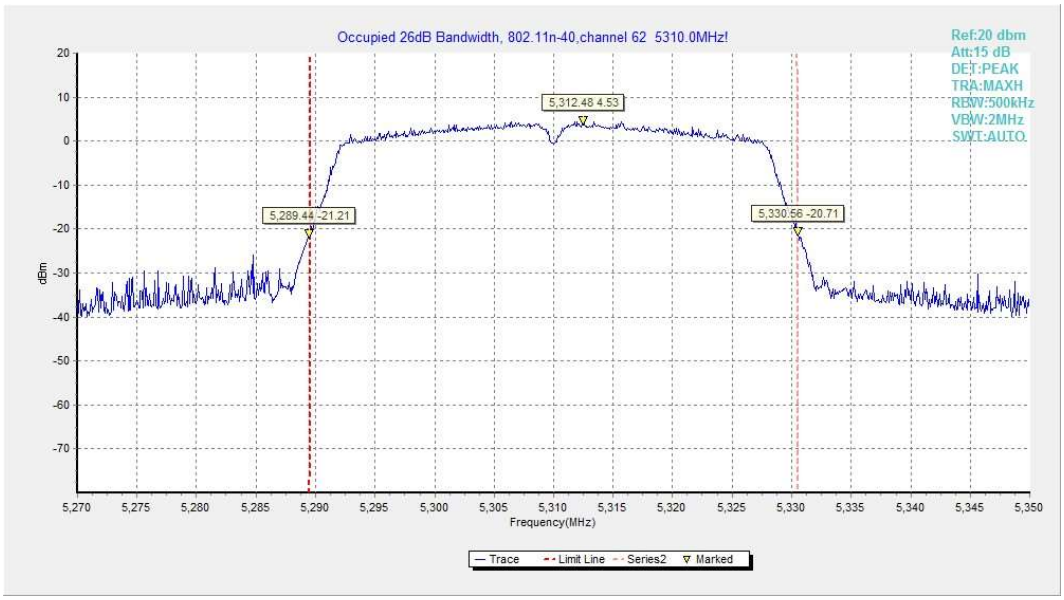


Fig.24 Occupied 26dB Bandwidth (802.11n-HT40, 5310MHz)

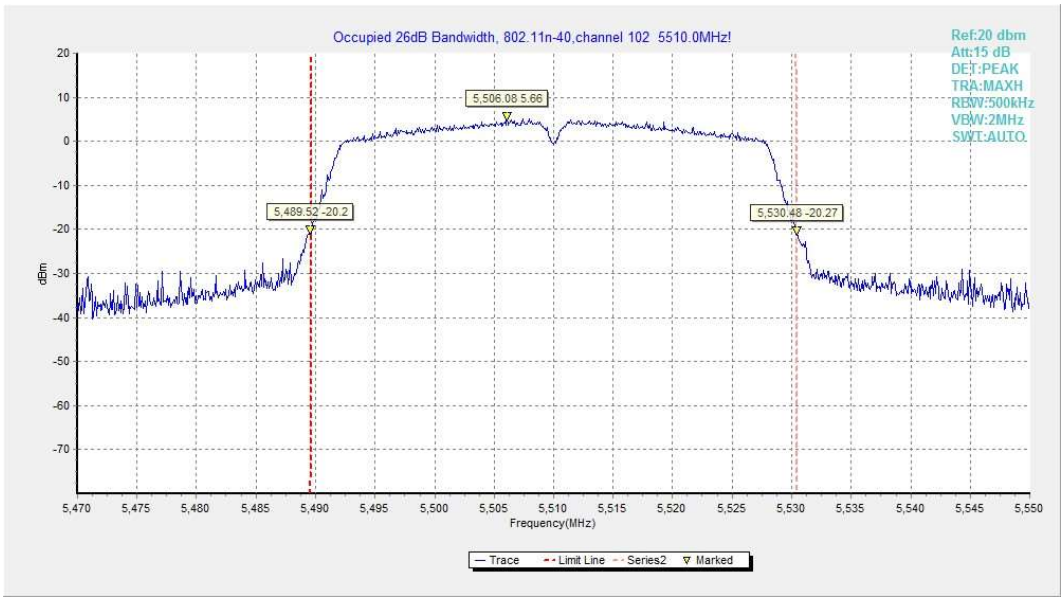


Fig.25 Occupied 26dB Bandwidth (802. 11n-HT40, 5510MHz)

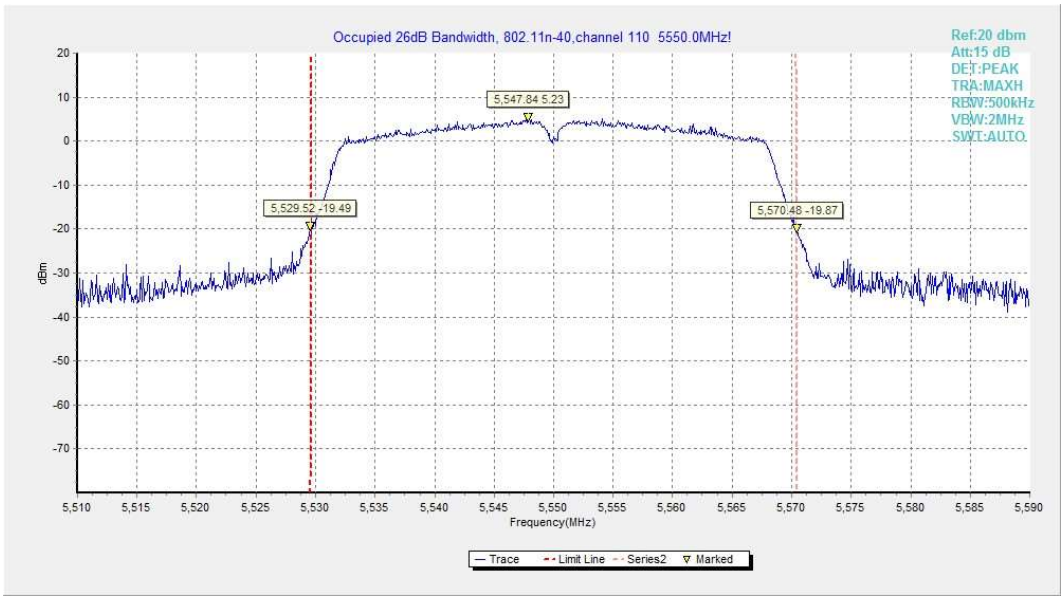


Fig.26 Occupied 26dB Bandwidth (802. 11n-HT40, 5590MHz)

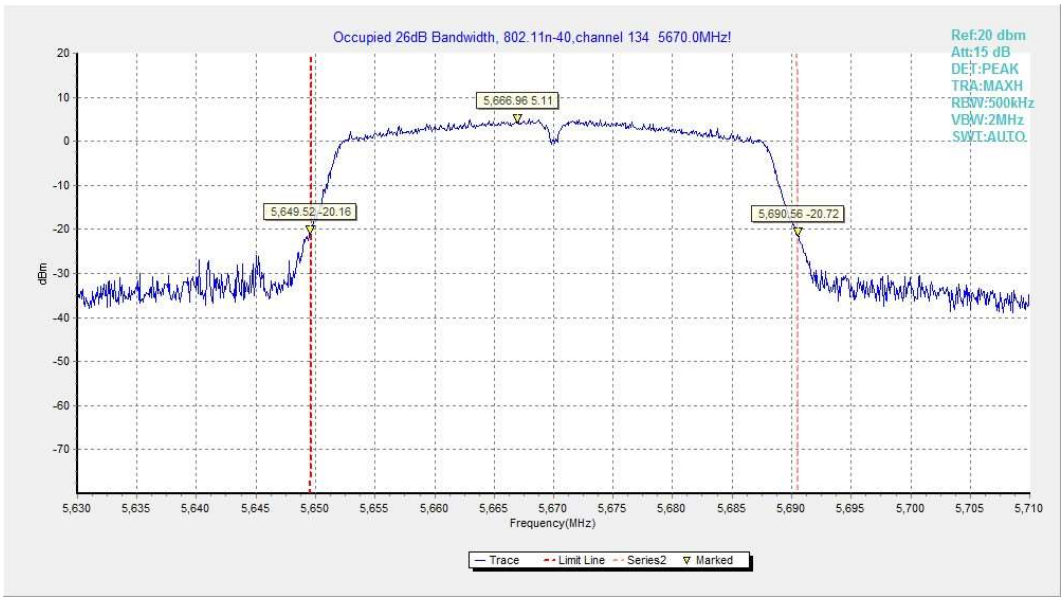


Fig.27 Occupied 26dB Bandwidth (802. 11n-HT40, 5670MHz)

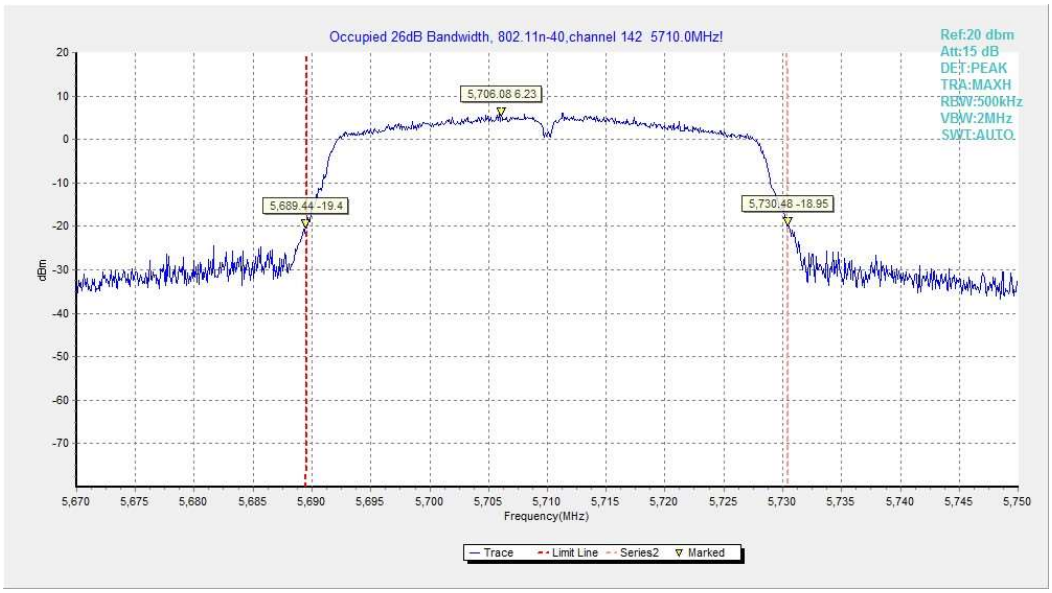


Fig.28 Occupied 26dB Bandwidth (802. 11n-HT40, 5710MHz)

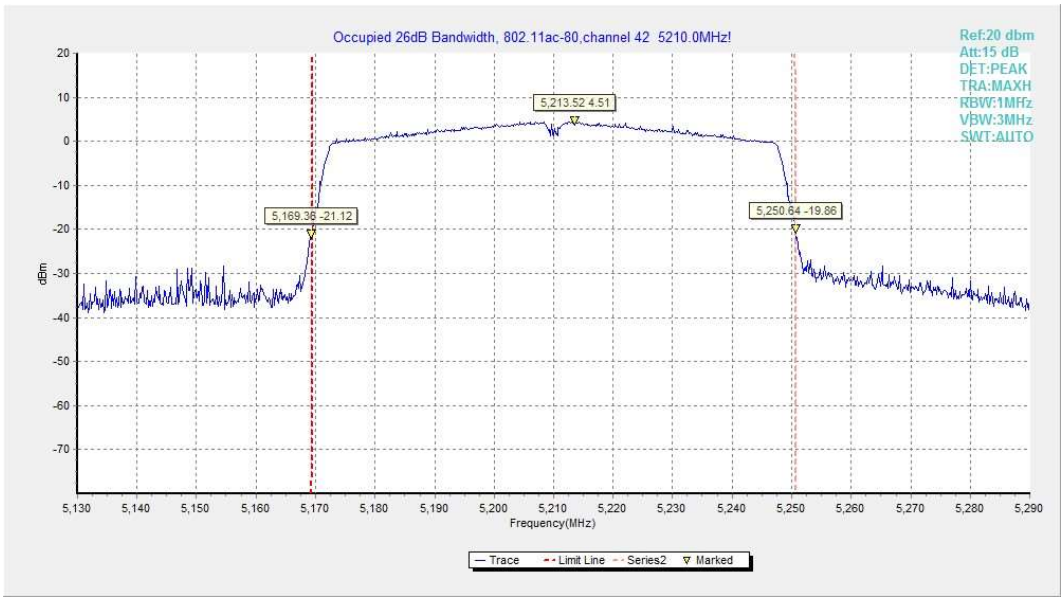


Fig.29 Occupied 26dB Bandwidth (802. 11ac-HT80, 5210MHz)

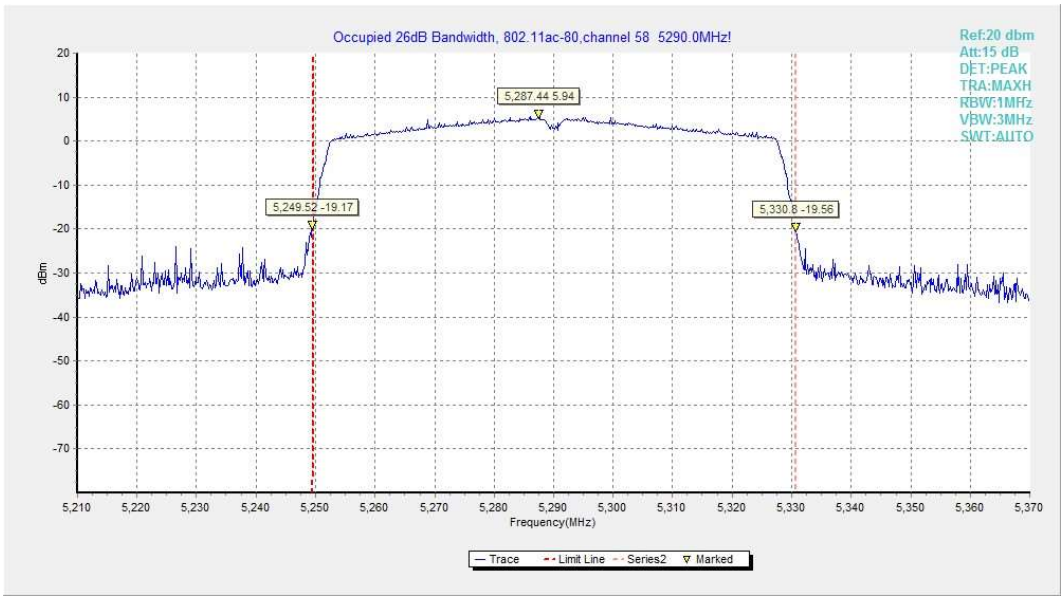


Fig.30 Occupied 26dB Bandwidth (802. 11ac-HT80, 5290MHz)

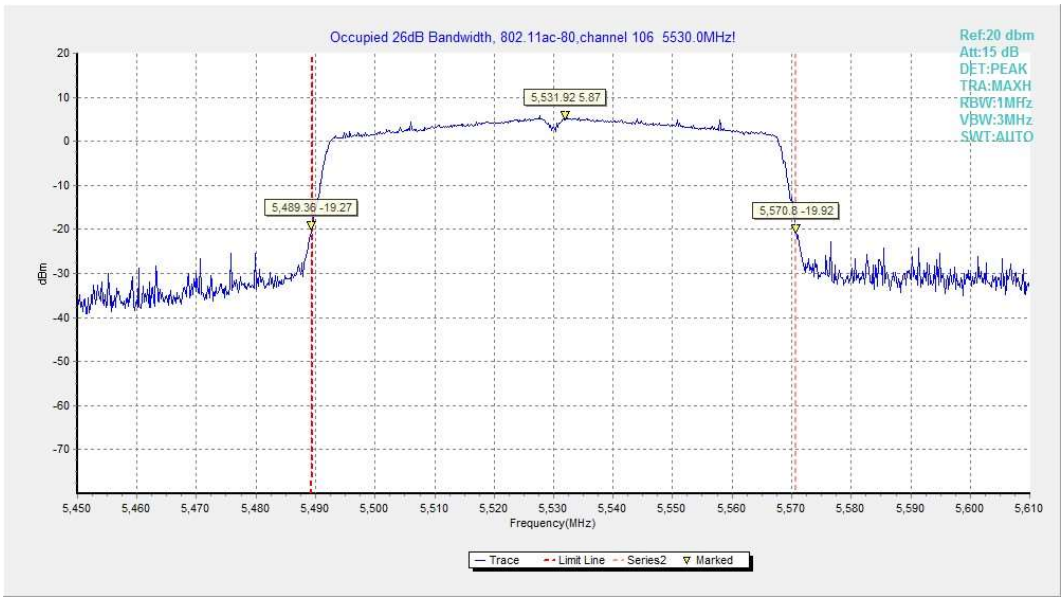


Fig.31 Occupied 26dB Bandwidth (802. 11ac-HT80, 5530MHz)

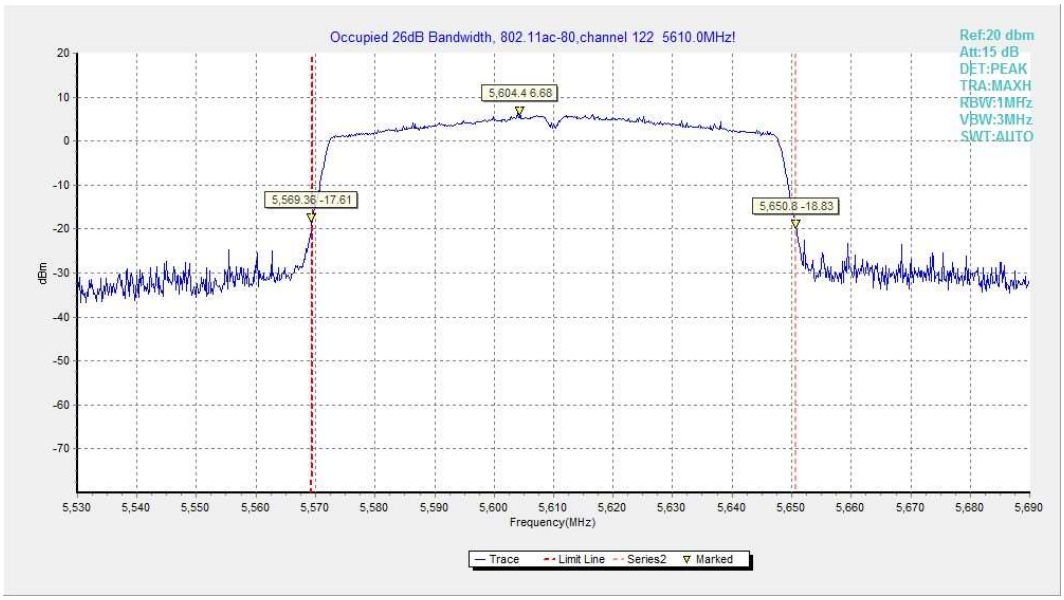


Fig.32 Occupied 26dB Bandwidth (802. 11ac-HT80, 5610MHz)

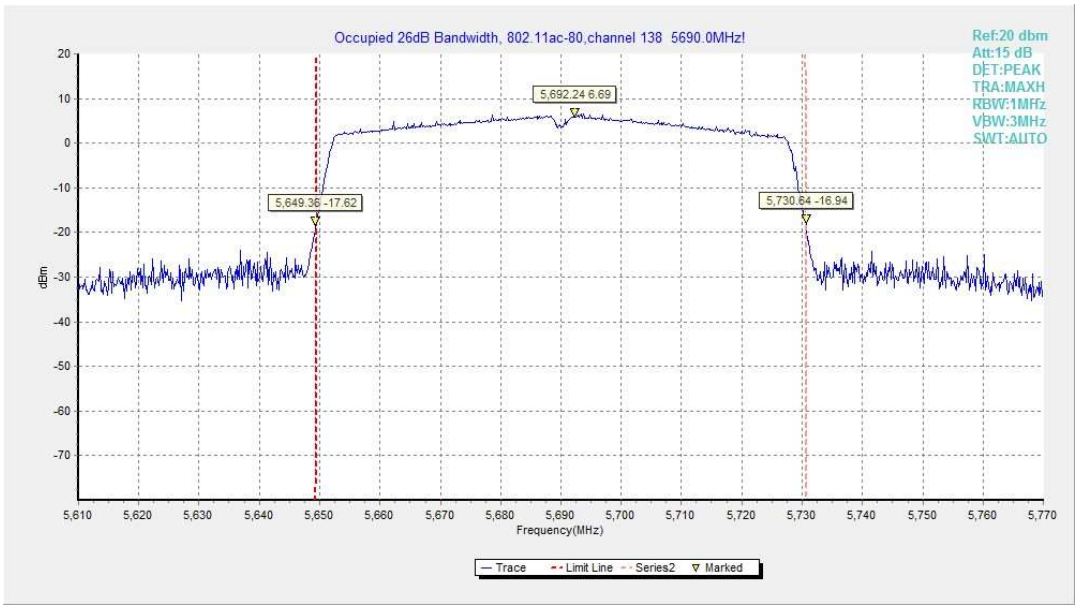


Fig.33 Occupied 26dB Bandwidth (802. 11ac-HT80, 5690MHz)

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 results derived from initial model:

EUT ID: UT19a

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	5180 MHz	Fig.38	P

HT20	5320 MHz	Fig.39	P
	5500 MHz	Fig.40	P
	5700 MHz	Fig.41	P
802.11ac HT20	5180 MHz	Fig.42	P
	5320 MHz	Fig.43	P
	5500 MHz	Fig.44	P
	5700 MHz	Fig.45	P
802.11n HT40	5190 MHz	Fig.46	P
	5310 MHz	Fig.47	P
	5510 MHz	Fig.48	P
	5670 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:

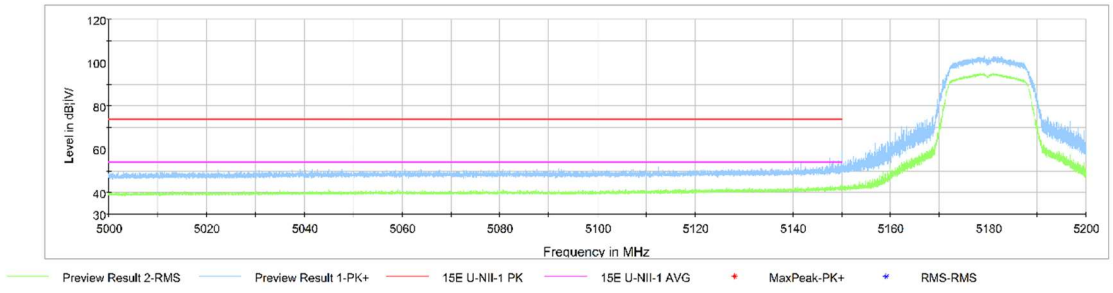


Fig.34 Band Edges (802.11a Ch36, 5180MHz)

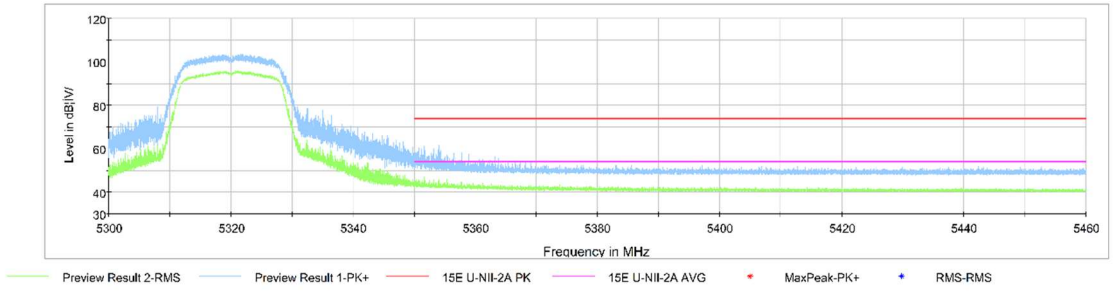


Fig.35 Band Edges (802.11a Ch64, 5320MHz)

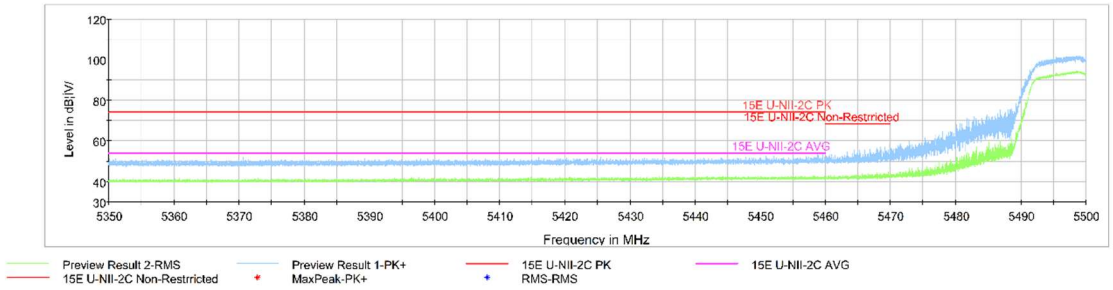


Fig.36 Band Edges (802.11a Ch100, 5500MHz)

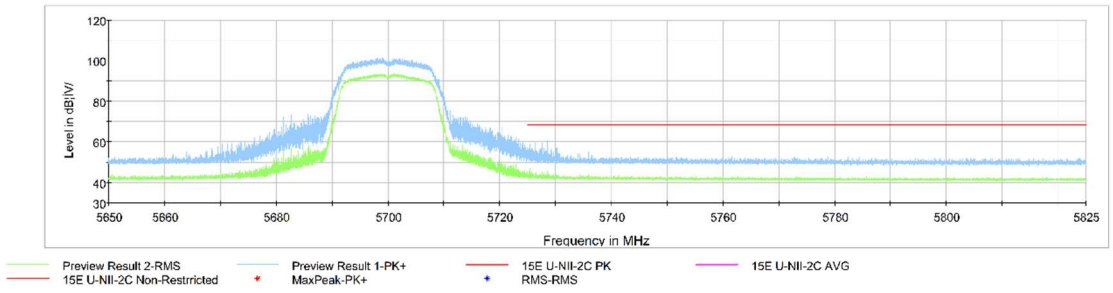


Fig.37 Band Edges (802.11a Ch140, 5700MHz)

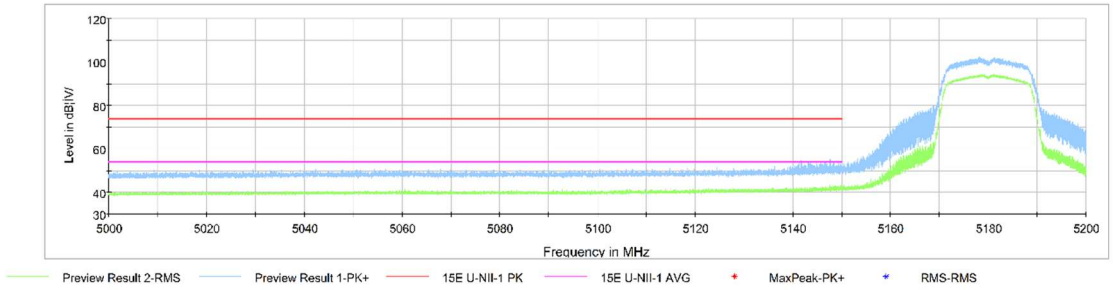


Fig.38 Band Edges (802.11n-HT20 Ch36, 5180MHz)

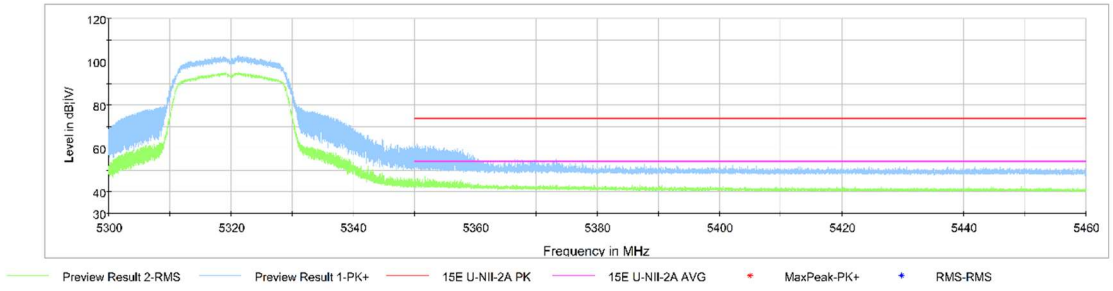


Fig.39 Band Edges (802.11n-HT20 Ch64, 5320MHz)

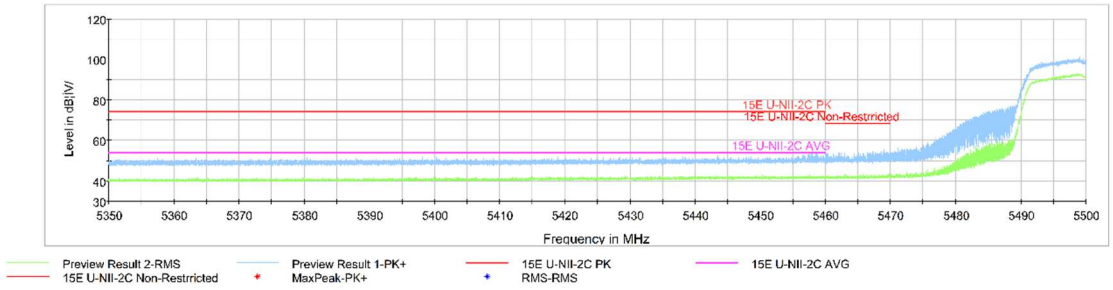


Fig.40 Band Edges (802.11n-HT20 Ch100, 5500MHz)

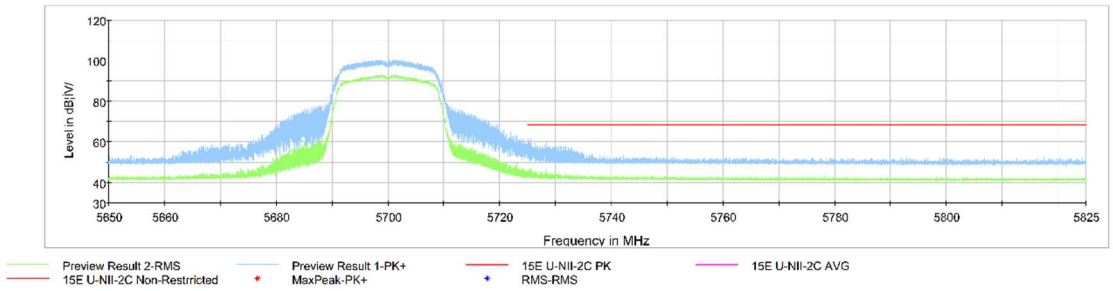


Fig.41 Band Edges (802.11n-HT20 Ch140, 5700MHz)

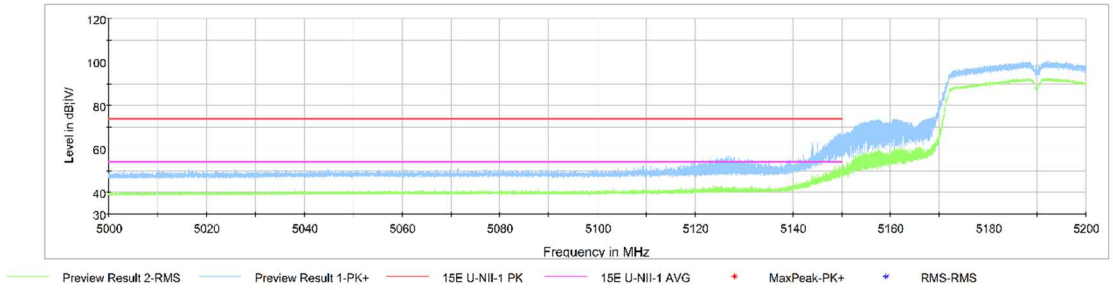


Fig.42 Band Edges (802.11n-HT40 Ch38, 5190MHz)

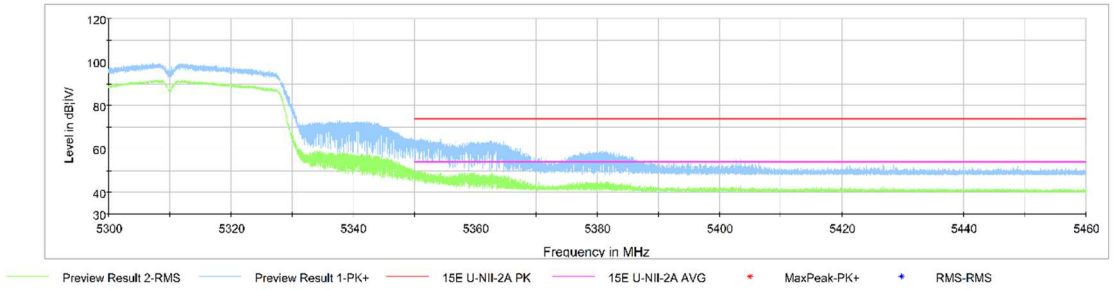


Fig.43 Band Edges (802.11n-HT40 Ch62, 5310MHz)

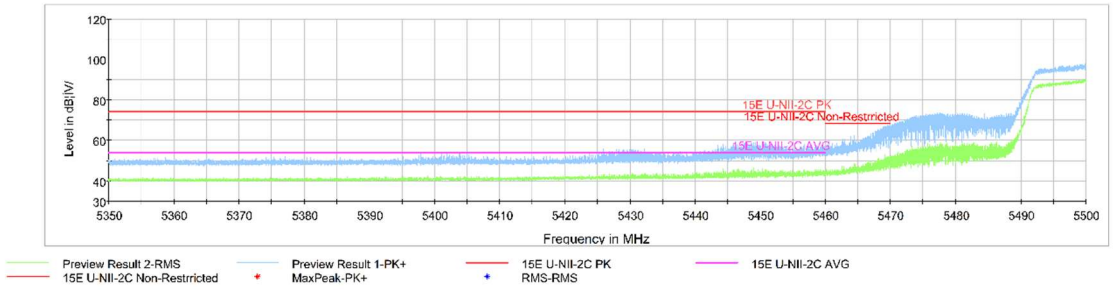


Fig.44 Band Edges (802.11n-HT40 Ch102, 5510MHz)

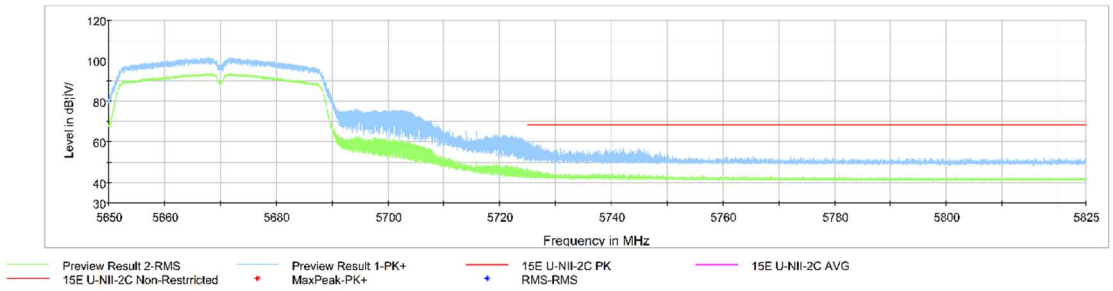


Fig.45 Band Edges (802.11n-HT40 Ch134, 5670MHz)

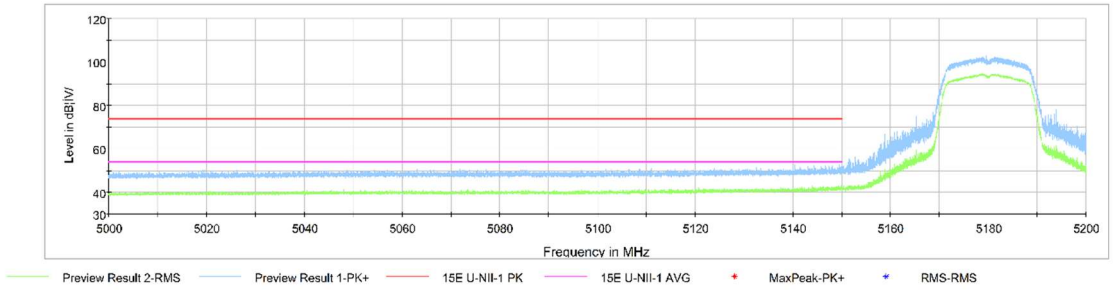


Fig.46 Band Edges (802.11ac-HT20 Ch36, 5180MHz)

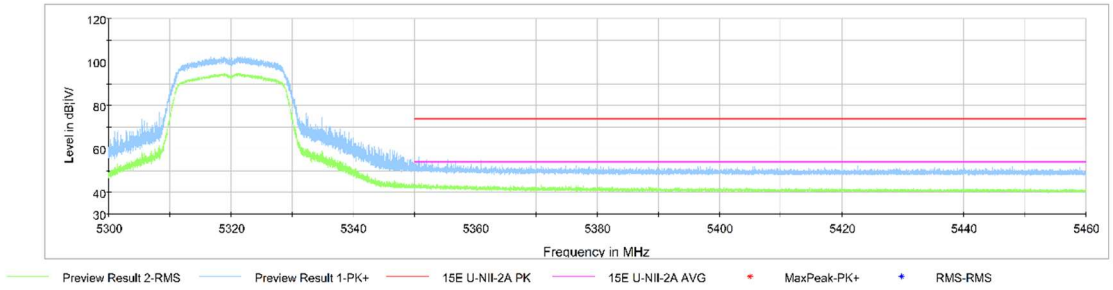


Fig.47 Band Edges (802.11ac-HT20 Ch64, 5320MHz)

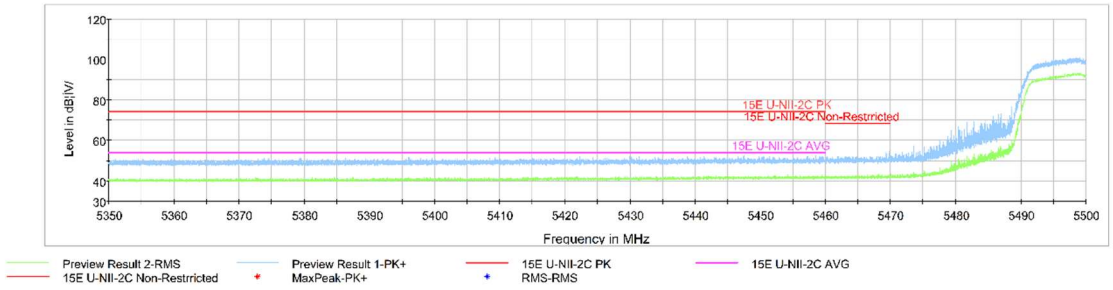


Fig.48 Band Edges (802.11ac-HT20 Ch100, 5500MHz)

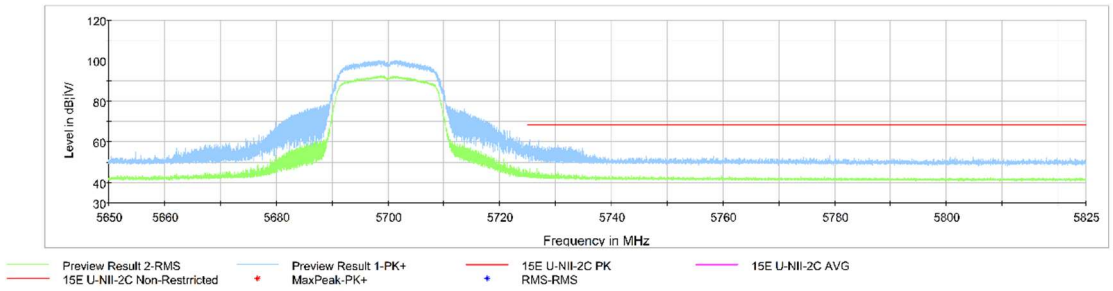


Fig.49 Band Edges (802.11ac-HT20 Ch140, 5700MHz)

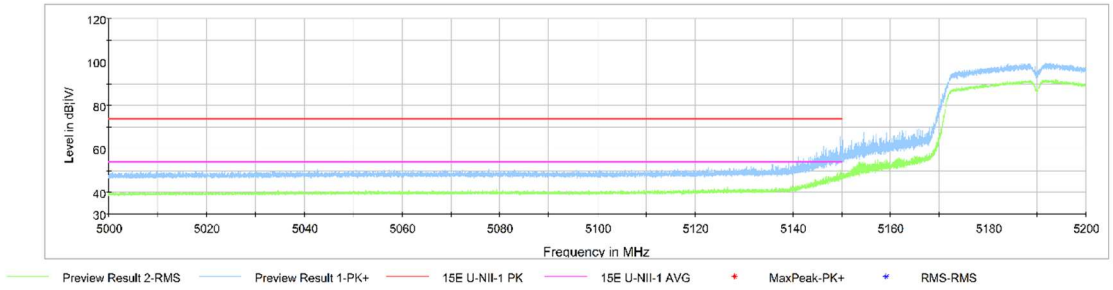


Fig.50 Band Edges (802.11ac-HT40 Ch38, 5190MHz)

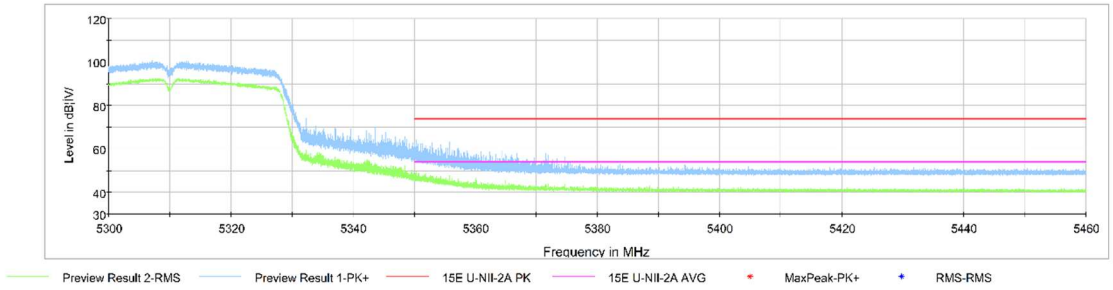


Fig.51 Band Edges (802.11ac-HT40 Ch62, 5310MHz)

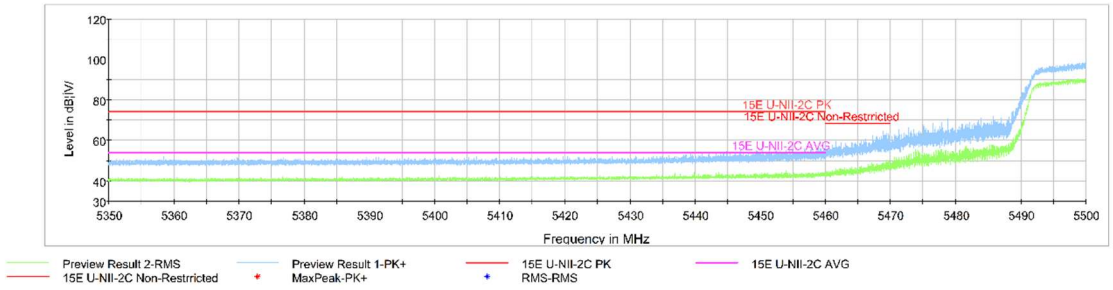


Fig.52 Band Edges (802.11ac-HT40 Ch102, 5510MHz)

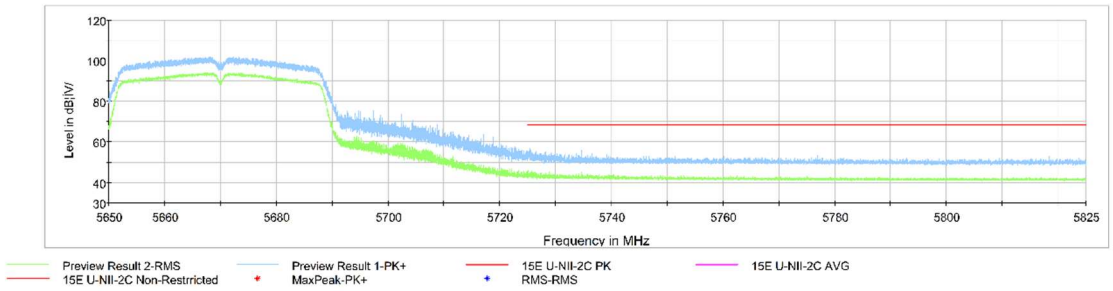


Fig.53 Band Edges (802.11ac-HT40 Ch134, 5670MHz)

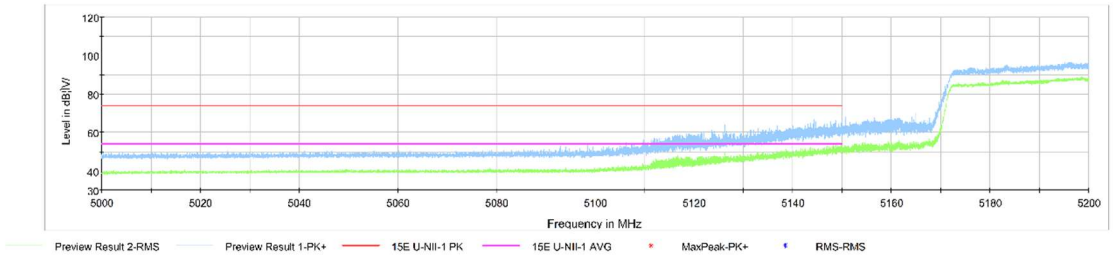


Fig.54 Band Edges (802.11ac-HT80 Ch42 , 5210MHz)

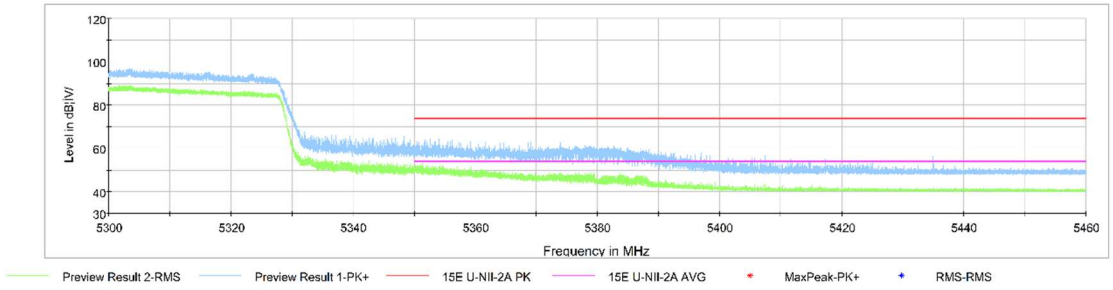


Fig.55 Band Edges (802.11ac-HT80 Ch58, 5290MHz)

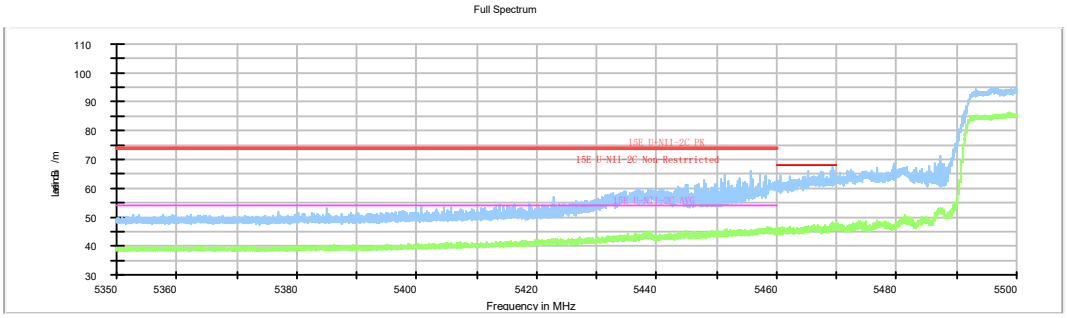


Fig.56 Band Edges (802.11ac-HT80 Ch106, 5530MHz)

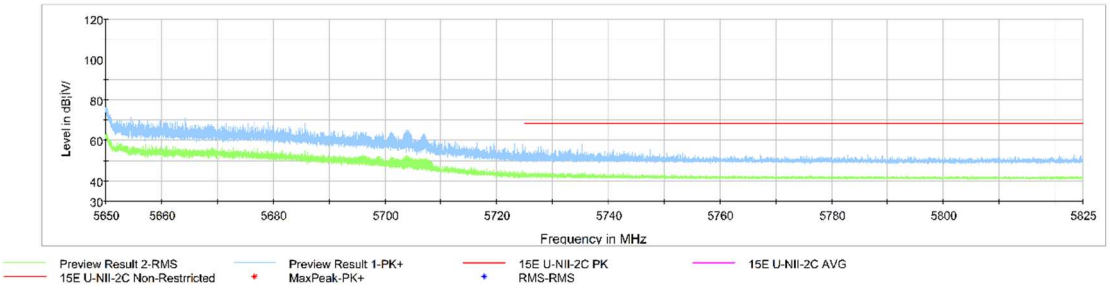


Fig.57 Band Edges (802.11ac-HT80 Ch122, 5610MHz)

Measurement results for variant model:

EUT ID: UT07a

Mode	Channel	Test Results	Conclusion
802.11a	5180 MHz	Fig.58	P
	5320 MHz	Fig.59	P
	5500 MHz	Fig.60	P
802.11n HT40	5190 MHz	Fig.61	P
	5310 MHz	Fig.62	P
	5510 MHz	Fig.63	P
802.11ac HT80	5210MHz	Fig.64	P
	5290MHz	Fig.65	P
	5530MHz	Fig.66	P

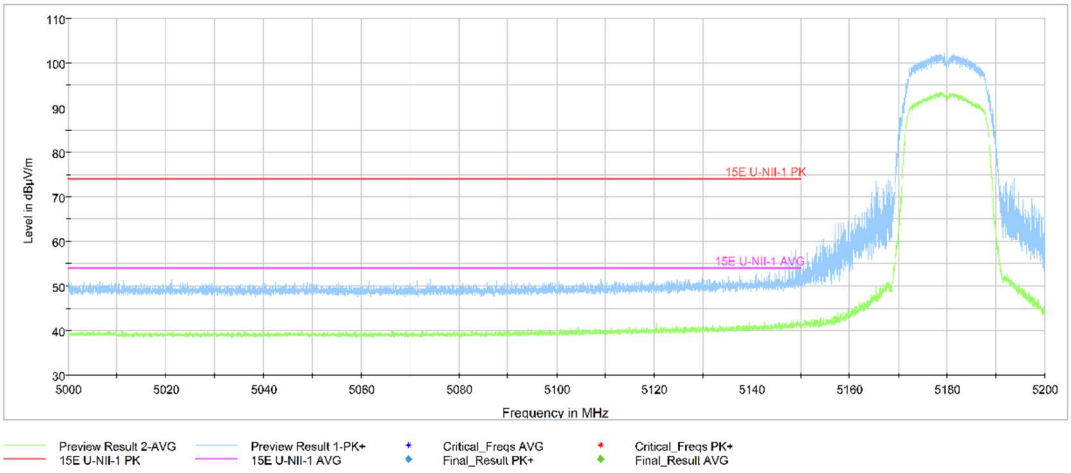


Fig.58 Band Edges (802.11a Ch36, 5180MHz)

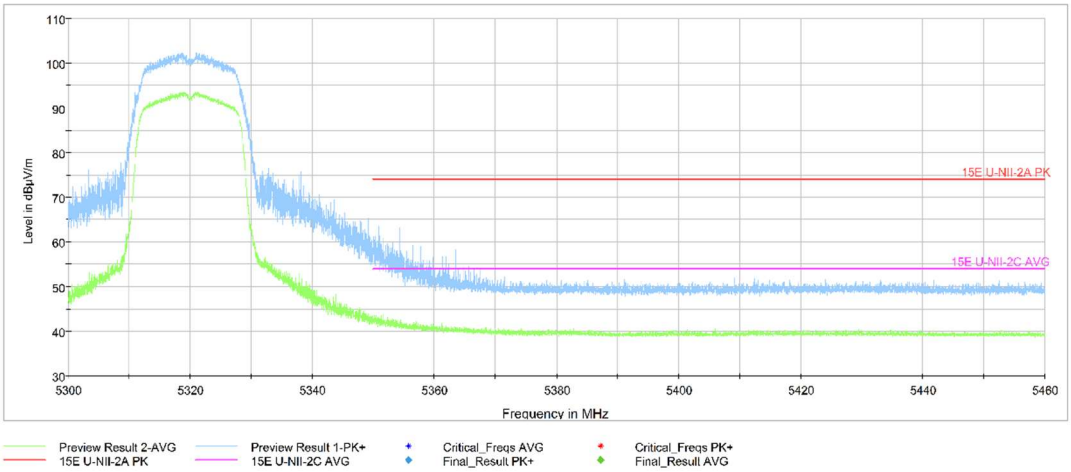


Fig.59 Band Edges (802.11a Ch64, 5320MHz)

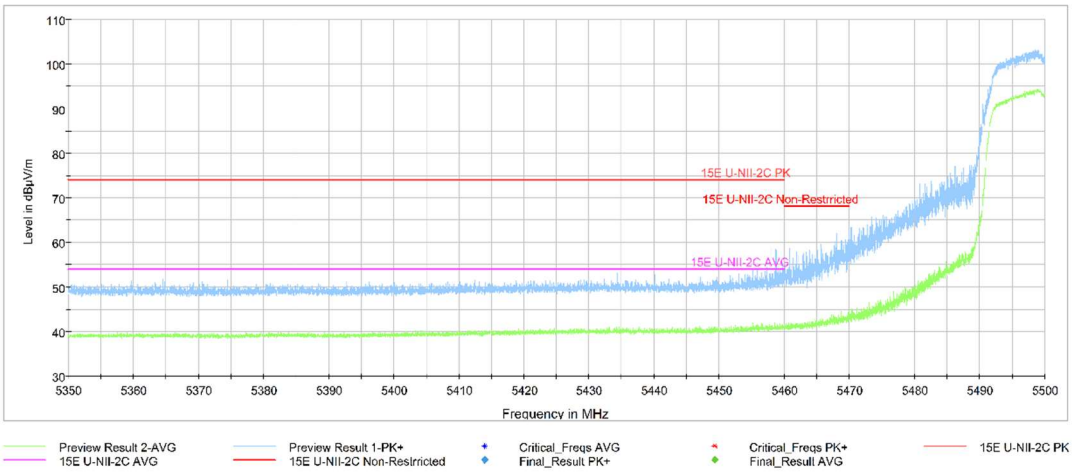


Fig.60 Band Edges (802.11a Ch100, 5500MHz)

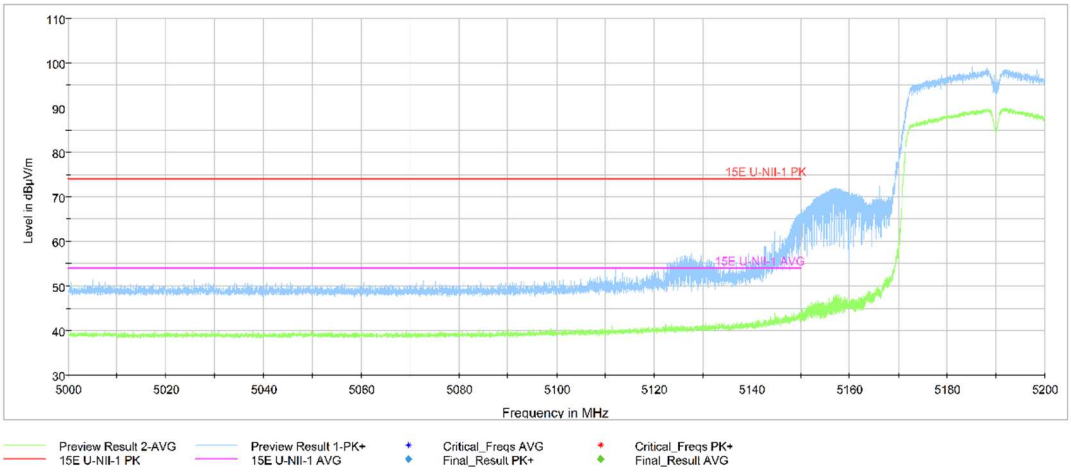


Fig.61 Band Edges (802.11n-HT40 Ch38, 5190MHz)

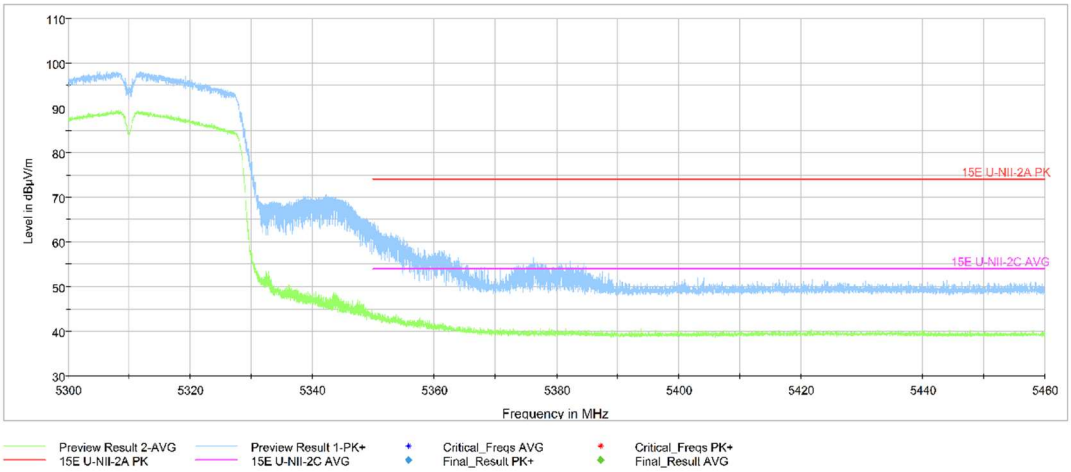


Fig.62 Band Edges (802.11n-HT40 Ch62, 5310MHz)

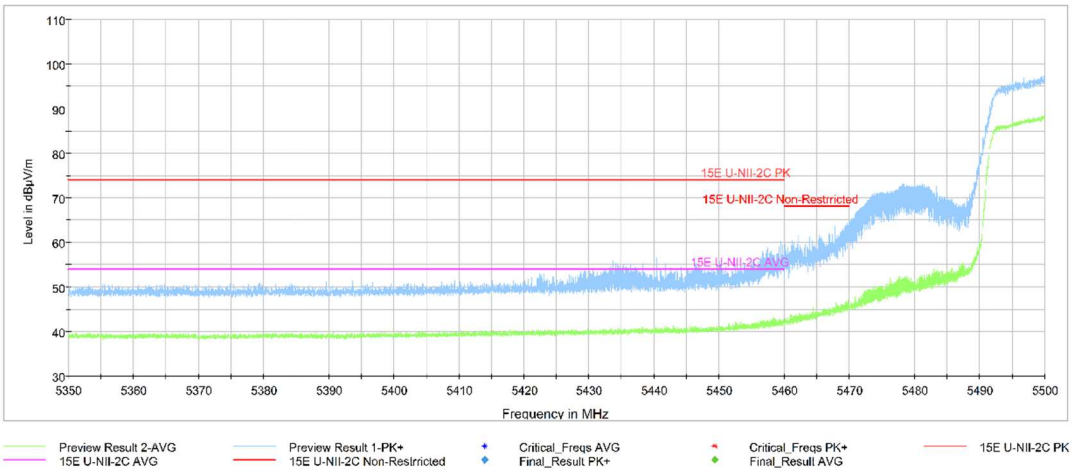


Fig.63 Band Edges (802.11n-HT40 Ch102, 5510MHz)

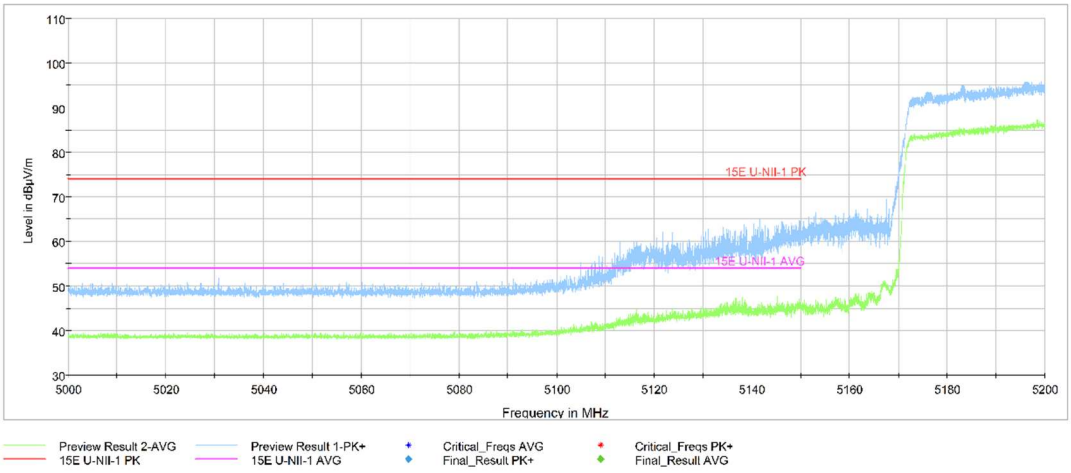


Fig.64 Band Edges (802.11ac-HT80 Ch42 , 5210MHz)

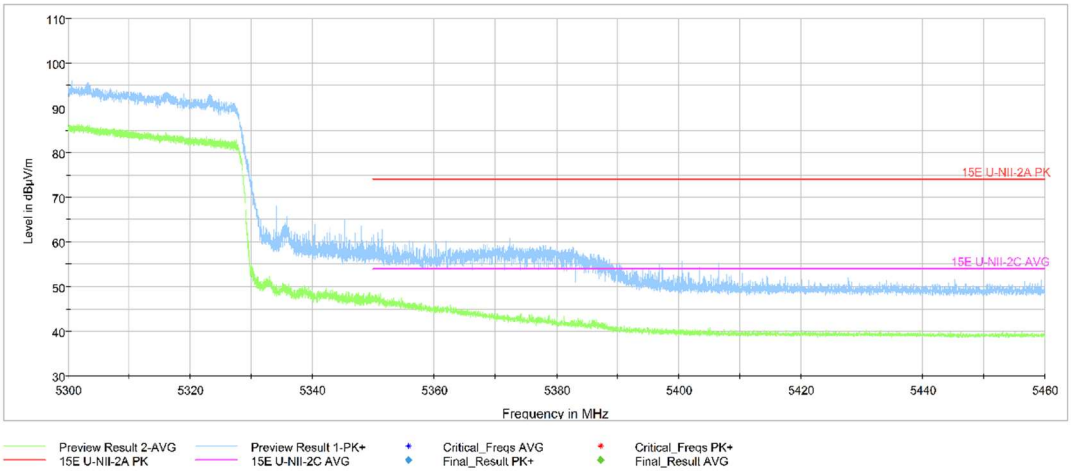


Fig.65 Band Edges (802.11ac-HT80 Ch58, 5290MHz)

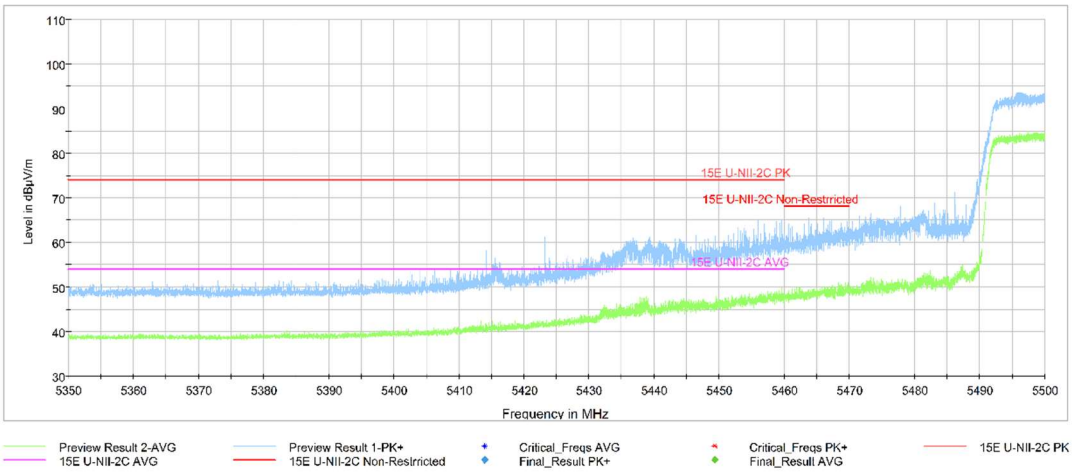


Fig.66 Band Edges (802.11ac-HT80 Ch106, 5530MHz)

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 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 Results derived from initial model:

EUT ID:UT19a

802.11a mode

Mode	Channel	Test Results	Conclusion
802.11a	36(5180MHz)	---	P
	40(5200MHz)	---	P
	48(5240MHz)	---	P
	52(5260MHz)	---	P
	56(5280MHz)	---	P
	64(5320MHz)	---	P
	100(5500MHz)	---	P
	120(5600MHz)	---	P
	140(5700MHz)	---	P

802.11n-HT20 mode

Mode	Channel	Test Results	Conclusion
802.11n -HT20	36(5180MHz)	---	P
	40(5200MHz)	---	P
	48(5240MHz)	---	P
	52(5260MHz)	---	P
	56(5280MHz)	---	P
	64(5320MHz)	---	P
	100(5500MHz)	---	P
	120(5600MHz)	---	P
	140(5700MHz)	---	P

802.11n-HT40 mode

Mode	Channel	Test Results	Conclusion
802.11n HT40	38(5190MHz)	---	P
	46(5230MHz)	---	P
	54(5270MHz)	---	P
	62(5310MHz)	---	P
	102(5510MHz)	---	P
	118(5590MHz)	---	P
	134(5670MHz)	---	P

802.11ac-HT20 mode

Mode	Channel	Test Results	Conclusion
802.11ac -HT20	36(5180MHz)	---	P
	40(5200MHz)	---	P
	48(5240MHz)	---	P
	52(5260MHz)	---	P
	56(5280MHz)	---	P
	64(5320MHz)	---	P
	100(5500MHz)	---	P
	120(5600MHz)	---	P
	140(5700MHz)	---	P

802.11ac-HT40 mode

Mode	Channel	Test Results	Conclusion
802.11ac HT40	38(5190MHz)	---	P
	46(5230MHz)	---	P
	54(5270MHz)	---	P
	62(5310MHz)	---	P
	102(5510MHz)	---	P
	118(5590MHz)	---	P
	134(5670MHz)	---	P

802.11ac-HT80 mode

Mode	Channel	Test Results	Conclusion
802.11ac – HT80	42(5210MHz)	---	P
	58(5290MHz)	---	P
	106(5530MHz)	---	P
	122(5610MHz)	---	P

Note:

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

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

The measurement results are obtained as described below:

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