



FCC PART 15 TEST REPORT No.I22Z70098-IOT04

for

Samsung Electronics Co., Ltd.

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

SM-A045M/DS, SM-A045M

With

FCC ID: ZCASMA045M

Hardware Version: REV1.0

Software Version: A045M.001

Issued Date: 2022-06-27

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

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1. TEST LABORATORY

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 (BDA)

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

1.3. Testing Environment

Normal Temperature: 15-35°C

Relative Humidity: 20-75%

1.4. Project date

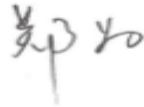
Testing Start Date: 2022-04-15

Testing End Date: 2022-06-25

1.5. Signature

谢秀珍

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(Prepared this test report)



Zheng Wei
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2. CLIENT INFORMATION

2.1 Applicant Information

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2.2 Manufacturer Information

Company Name: SAMSUNG Electronics Co., Ltd.
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Youngtong gu, Suwon city 443 742, Korea
Contact: Sunghoon Cho
Email: ggobi.cho@samsung.com
Telephone: +82-10-2722-4159
Fax: /

3. EQUIPMENT UNDER TEST (EUT) AND

ANCILLARY EQUIPMENT(AE)

3.1. About EUT

Description	Multi-band GSM/WCDMA/LTE phone with Bluetooth, WLAN
Model name	SM-A045M/DS, SM-A045M
FCC ID	ZCASMA045M
WLAN Frequency Band	ISM Bands: -5150MHz~5250MHz -5250MHz~5350MHz -5470MHz~5725MHz
Type of modulation	OFDM
Antenna gain	-1.26dBi
Voltage	3.85V

3.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version
UT18a	2270098UT18a	REV1.0	A045M.001
UT22a	2270098UT22a	REV1.0	A045M.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	Data Cable1	/
AE5	Data Cable2	/
AE6	Headset1	/
AE7	Headset2	/
AE8	Battery	/
AE1		
Model		EP-TA200JWE
Manufacturer		HAEM Co.,Ltd
Length of cable		/
AE2		
Model		EP-TA200JWE
Manufacturer		SoluM Co.,Ltd.
Length of cable		/

AE3

Model	EP-TA200JWE
Manufacturer	RFTECH Co., Ltd.
Length of cable	/
AE4	
Model	EP-DR140AWE
Manufacturer	DONGGUAN KSD CO.,LTD
Length of cable	/
AE5	
Model	EP-DR140AWE
Manufacturer	CRESYN HANOI Co., Ltd
Length of cable	/
AE6	
Model	EHS61ASFWE
Manufacturer	DONGGUAN YOUNGBO ELECTRONICS CO.,LTD
Length of cable	/
AE7	
Model	EHS61ASFWE
Manufacturer	Shenzhen Grandsound Electronics Co.,Ltd
Length of cable	/
AE8	
Model	/
Manufacturer	/
Length of cable	/

*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.

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

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	/	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/manufacture 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°C
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	2023-05-15
2	Shielding Room	S81	/	ETS-Lindgren	/	/

Radiated emission test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Period	Calibration Due date
1	Test Receiver	ESU26	100376	R&S	1 year	2022-09-15
2	Test Receiver	ESW44	103015	R&S	1 year	2022-09-02
3	EMI Antenna	VULB9163	01176	Schwarzbeck	1 year	2022-11-15
4	EMI Antenna	3117	00139065	ETS-Lindgren	1 year	2022-09-13
5	EMI Antenna	3115	00146404	ETS-Lindgren	1 year	2023-02-23
6	EMI Antenna	LB-180400-25-C-KF	J211060826	A-INFO	1 year	2023-02-27
7	Loop Antenna	HFH2-Z2	829324/007	R&S	1 year	2022-12-22

AC Power Line Conducted Emission

No.	Equipment	Model	Manufacturer	Serial Number	Calibration Period	Calibration Due date
1	LISN	ENV216	101459	R&S	1 year	2023-03-26
2	Test Receiver	ESCI	100766	R&S	1 year	2023-03-02

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)
$30\text{MHz} \leq f \leq 2\text{GHz}$	1.22
$2\text{GHz} \leq f \leq 3.6\text{GHz}$	1.22
$3.6\text{GHz} \leq f \leq 8\text{GHz}$	1.22
$8\text{GHz} \leq f \leq 12.75\text{GHz}$	1.51
$12.75\text{GHz} \leq f \leq 26\text{GHz}$	1.51
$26\text{GHz} \leq f \leq 40\text{GHz}$	1.59

Radiated (k=2)

Frequency Range	Uncertainty(dB)
9kHz-30MHz	/
$30\text{MHz} \leq f \leq 1\text{GHz}$	5.73
$1\text{GHz} \leq f \leq 18\text{GHz}$	5.58
$18\text{GHz} \leq f \leq 40\text{GHz}$	3.37

8.6. AC Power-line Conducted Emission

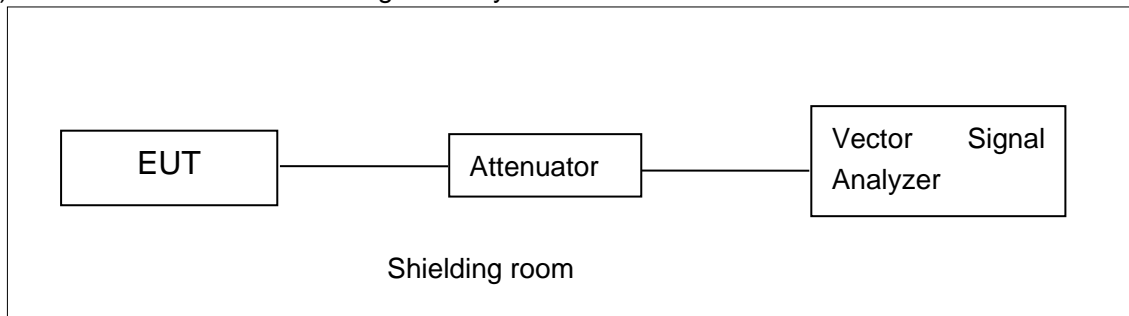
Measurement Uncertainty : 3.10,k=2

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

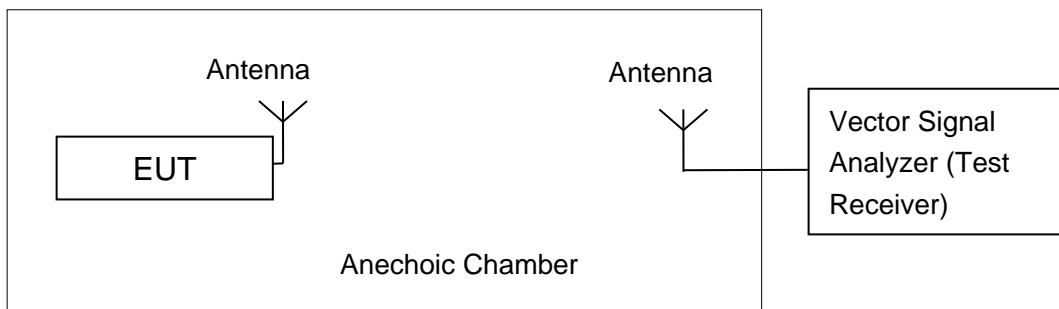


A.1.2. Radiated Emission Measurements

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 measurement method SA-2 is made according to KDB 789033

Note:

For straddle channel 20MHz Bandwidth 5720MHz, Conducted Output Power Limit:

802.11a=11+10*log(B)=22.79, B=20.20/2+5=15.10MHz,

802.11n-HT20=11+10*log(B)=22.81, B=20.35/2+5=15.175MHz,

802.11ac-VHT20=11+10*log(B)=22.81, B=20.35/2+5=15.175MHz,

For straddle channel 40/80MHz Bandwidth, conducted output power limit=24 dBm

802.11n-HT40: B=40.32/2+15=35.16MHz,

802.11ac-VHT40: B=40.32/2+15=35.16MHz,

802.11ac-VHT80: B=80.32/2+35=75.175MHz

Measurement Results:

802.11a mode

Mode	Frequency	Test Result (dBm)							
		Data Rate (Mbps)							
		6	9	12	18	24	36	48	54
802.11a	5180MHz	15.05	/	/	/	/	/	/	/
	5200MHz	15.00	/	/	/	/	/	/	/
	5240MHz	15.02	/	/	/	/	/	/	/
	5260MHz	15.01	/	/	/	/	/	/	/
	5280MHz	14.97	/	/	/	/	/	/	/
	5320MHz	15.02	14.44	14.26	14.18	14.14	14.19	14.17	14.10
	5500MHz	14.50	/	/	/	/	/	/	/
	5580MHz	14.55	/	/	/	/	/	/	/
	5700MHz	11.96	/	/	/	/	/	/	/
	5720MHz	14.81	/	/	/	/	/	/	/

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	14.90	14.35	14.21	14.17	14.11	14.15	14.10	14.08
	5200MHz	14.83	/	/	/	/	/	/	/

	5240MHz	14.86	/	/	/	/	/	/	/
	5260MHz	14.79	/	/	/	/	/	/	/
	5280MHz	14.86	/	/	/	/	/	/	/
	5320MHz	14.66	/	/	/	/	/	/	/
	5500MHz	14.39	/	/	/	/	/	/	/
	5580MHz	14.48	/	/	/	/	/	/	/
	5700MHz	11.46	/	/	/	/	/	/	/
	5720MHz	14.66	/	/	/	/	/	/	/

The data rate MCS0 is selected as worse 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	14.53	13.74	13.75	13.85	13.73	13.46	13.48	12.67	12.06
	5200MHz	14.44	/	/	/	/	/	/	/	/
	5240MHz	14.28	/	/	/	/	/	/	/	/
	5260MHz	14.47	/	/	/	/	/	/	/	/
	5280MHz	14.28	/	/	/	/	/	/	/	/
	5320MHz	14.35	/	/	/	/	/	/	/	/
	5500MHz	13.87	/	/	/	/	/	/	/	/
	5580MHz	13.92	/	/	/	/	/	/	/	/
	5700MHz	10.93	/	/	/	/	/	/	/	/
	5720MHz	14.17	/	/	/	/	/	/	/	/

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	14.43	13.68	13.61	13.66	13.61	13.39	13.62	12.55
	5230MHz	14.23	/	/	/	/	/	/	/
	5270MHz	14.36	/	/	/	/	/	/	/
	5310MHz	14.14	/	/	/	/	/	/	/
	5510MHz	13.67	/	/	/	/	/	/	/
	5550MHz	13.86	/	/	/	/	/	/	/
	5670MHz	13.92	/	/	/	/	/	/	/
	5710MHz	13.98	/	/	/	/	/	/	/

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

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	14.49	13.72	13.78	13.52	13.51	13.38	13.22	12.65	12.08	11.04
	5230MHz	14.38	/	/	/	/	/	/	/	/	/
	5270MHz	14.33	/	/	/	/	/	/	/	/	/
	5310MHz	14.20	/	/	/	/	/	/	/	/	/
	5510MHz	13.67	/	/	/	/	/	/	/	/	/
	5550MHz	13.82	/	/	/	/	/	/	/	/	/
	5670MHz	13.90	/	/	/	/	/	/	/	/	/
	5710MHz	13.96	/	/	/	/	/	/	/	/	/

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	13.62	13.57	13.56	13.58	13.60	13.59	13.62	12.41	12.03	9.93
	5290MHz	13.61	/	/	/	/	/	/	/	/	/
	5530MHz	13.81	/	/	/	/	/	/	/	/	/
	5610MHz	13.67	/	/	/	/	/	/	/	/	/
	5690MHz	13.79	/	/	/	/	/	/	/	/	/

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

The duty cycle of all mode are 100%.

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	4.49	P
	5200 MHz	4.38	P
	5240 MHz	4.44	P
	5260 MHz	4.26	P
	5280 MHz	4.39	P
	5320 MHz	4.22	P
	5500 MHz	3.80	P
	5580 MHz	3.95	P
	5700 MHz	1.28	P
	5720 MHz	4.01	P
802.11n HT20	5180 MHz	4.28	P
	5200 MHz	4.25	P
	5240 MHz	4.08	P
	5260 MHz	4.28	P
	5280 MHz	4.07	P
	5320 MHz	3.93	P
	5500 MHz	3.73	P
	5580 MHz	3.63	P
	5700 MHz	0.43	P
	5720 MHz	3.65	P
802.11ac HT40	5190 MHz	0.80	P
	5230 MHz	0.90	P
	5270 MHz	0.79	P
	5310 MHz	0.49	P
	5510 MHz	0.25	P
	5550 MHz	0.23	P
	5670 MHz	0.21	P
	5710 MHz	0.20	P
802.11ac HT80	5210MHz	-3.10	P
	5290MHz	-3.40	P
	5530MHz	-3.12	P

	5610MHz	-3.06	P
	5690MHz	-3.02	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	20.05	P
	5200 MHz	Fig.2	20.35	P
	5240 MHz	Fig.3	20.20	P
	5260 MHz	Fig.4	20.10	P
	5280 MHz	Fig.5	20.05	P
	5320 MHz	Fig.6	20.20	P
	5500 MHz	Fig.7	20.15	P
	5580 MHz	Fig.8	20.35	P
	5700 MHz	Fig.9	19.90	P
	5720 MHz	Fig.10	20.20	P
802.11n HT20	5180 MHz	Fig.11	20.40	P
	5200 MHz	Fig.12	20.55	P
	5240 MHz	Fig.13	20.60	P
	5260 MHz	Fig.14	20.50	P
	5280 MHz	Fig.15	20.70	P
	5320 MHz	Fig.16	20.50	P
	5500 MHz	Fig.17	20.70	P
	5580 MHz	Fig.18	20.50	P
	5700 MHz	Fig.19	20.35	P
	5720 MHz	Fig.20	20.35	P
802.11ac HT40	5190 MHz	Fig.21	40.24	P
	5230 MHz	Fig.22	40.32	P
	5270 MHz	Fig.23	40.08	P

	5310 MHz	Fig.24	39.84	P
	5510 MHz	Fig.25	40.24	P
	5550 MHz	Fig.26	40.24	P
	5670 MHz	Fig.27	40.24	P
	5710 MHz	Fig.28	40.32	P

802.11ac HT80	5210MHz	Fig.29	80.64	P
	5290MHz	Fig.30	80.48	P
	5530MHz	Fig.31	80.48	P
	5610MHz	Fig.32	80.16	P
	5690MHz	Fig.33	80.32	P

Conclusion: PASS

Test graphs as below:

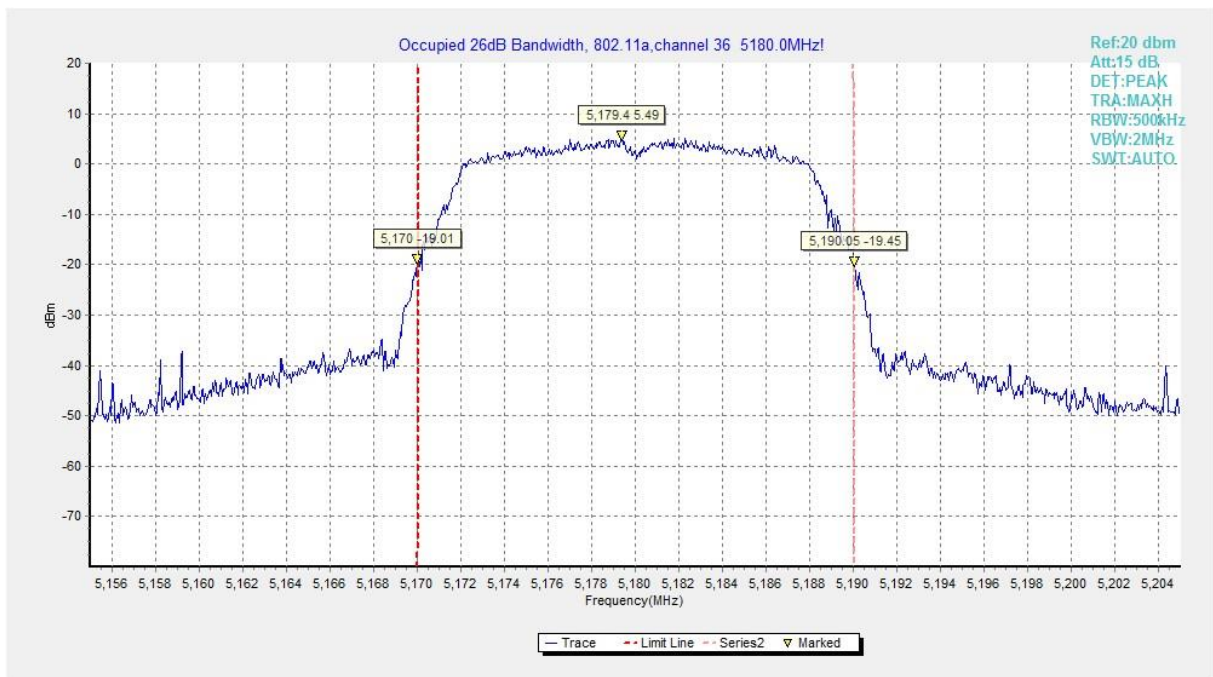


Fig.1 Occupied 26dB Bandwidth (802.11a, 5180MHz)

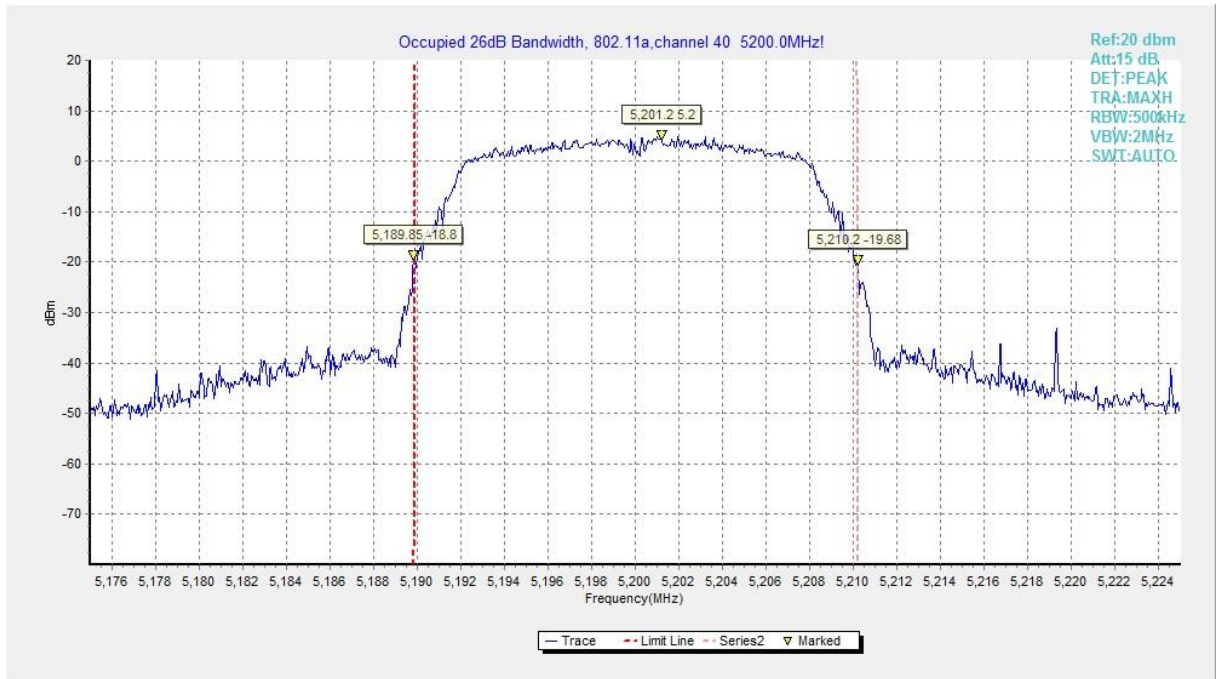


Fig.2 Occupied 26dB Bandwidth (802.11a, 5200MHz)

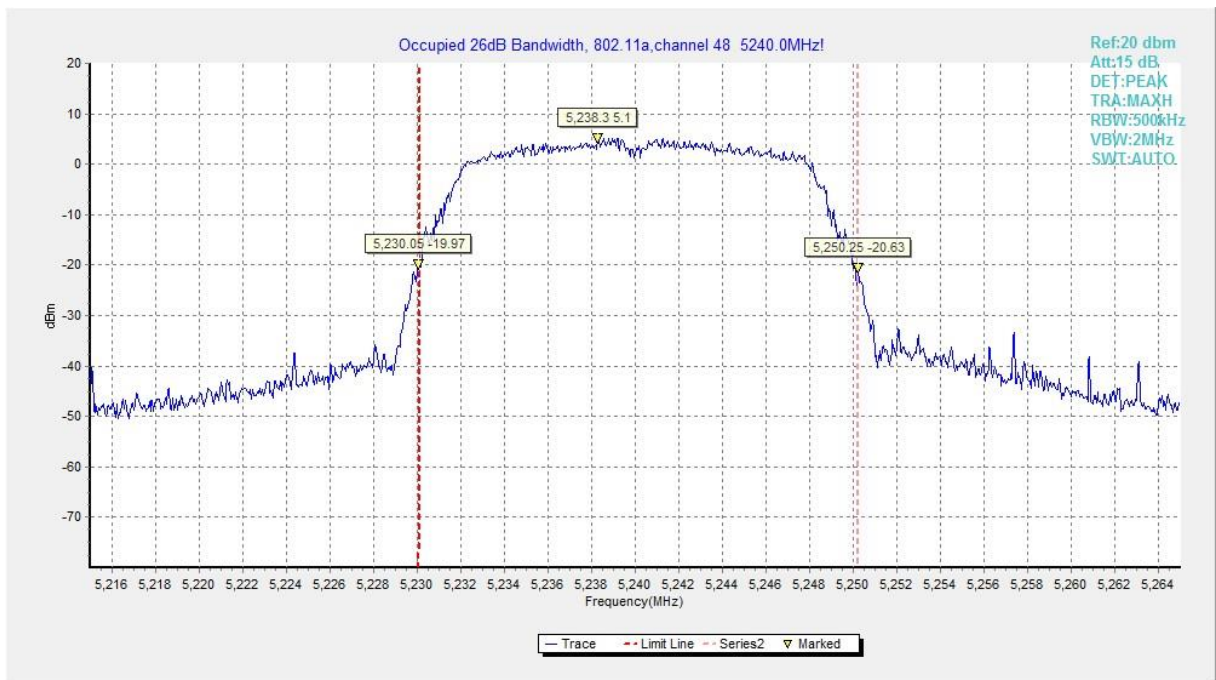


Fig.3 Occupied 26dB Bandwidth (802.11a, 5240MHz)

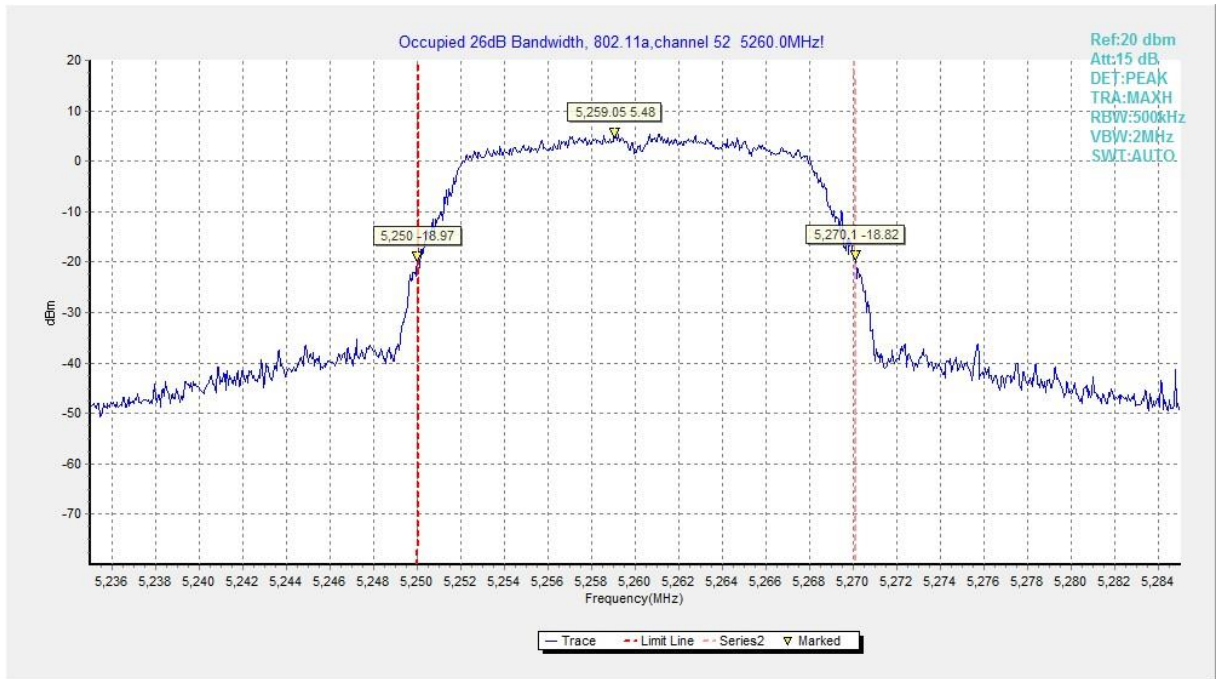


Fig.4 Occupied 26dB Bandwidth (802.11a, 5260MHz)

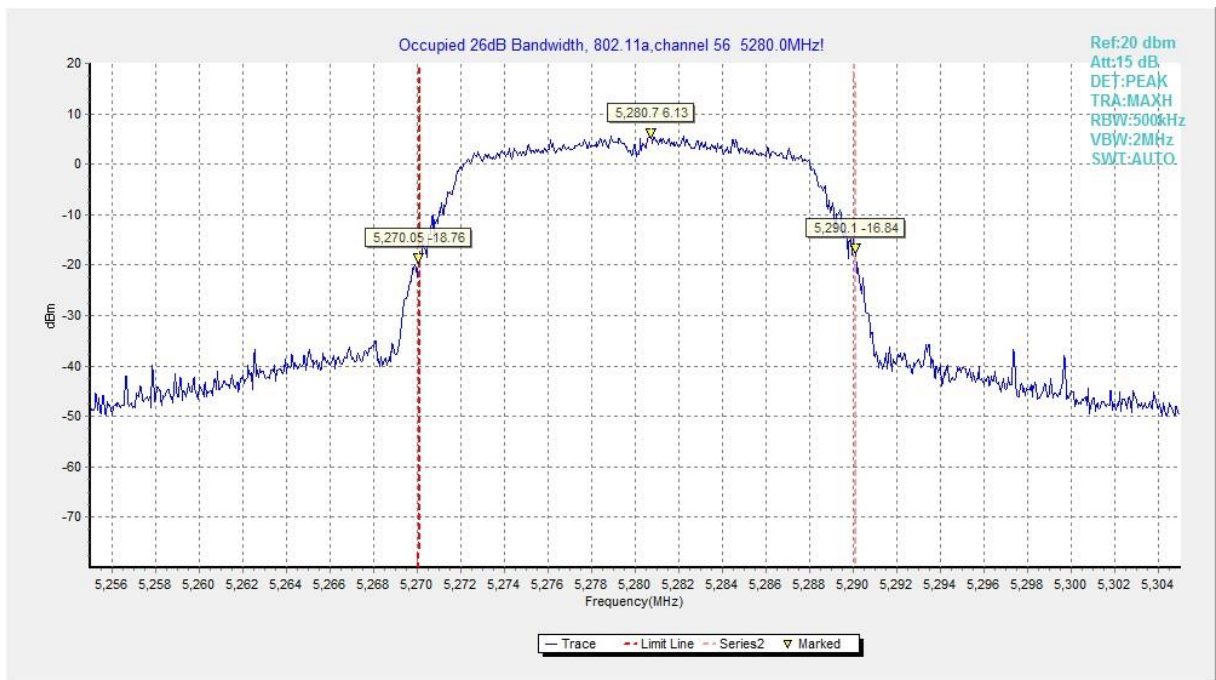


Fig.5 Occupied 26dB Bandwidth (802.11a, 5280MHz)

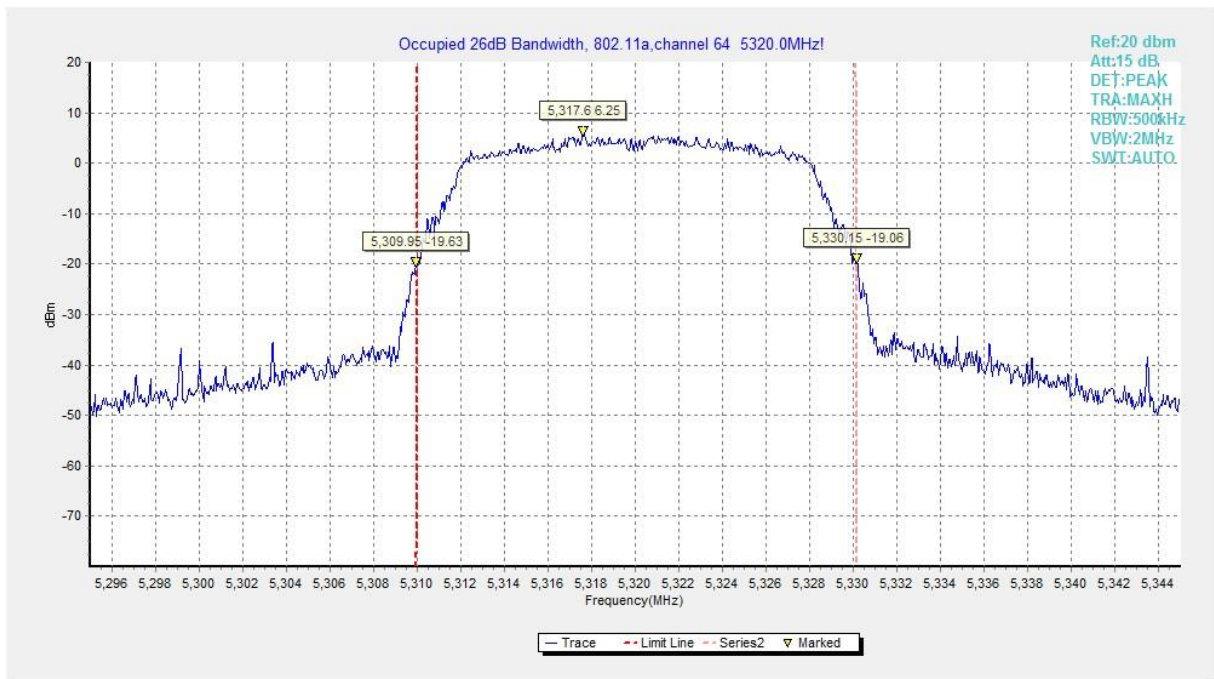


Fig.6 Occupied 26dB Bandwidth (802.11a, 5320MHz)

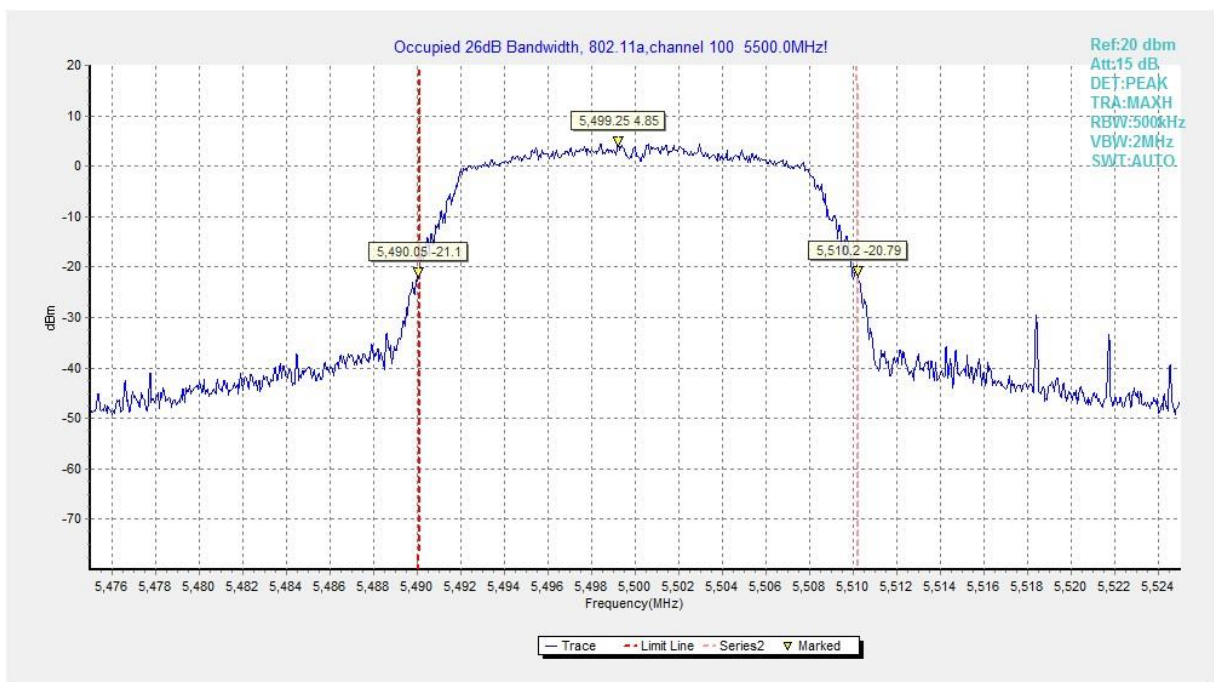


Fig.7 Occupied 26dB Bandwidth (802.11a, 5500MHz)

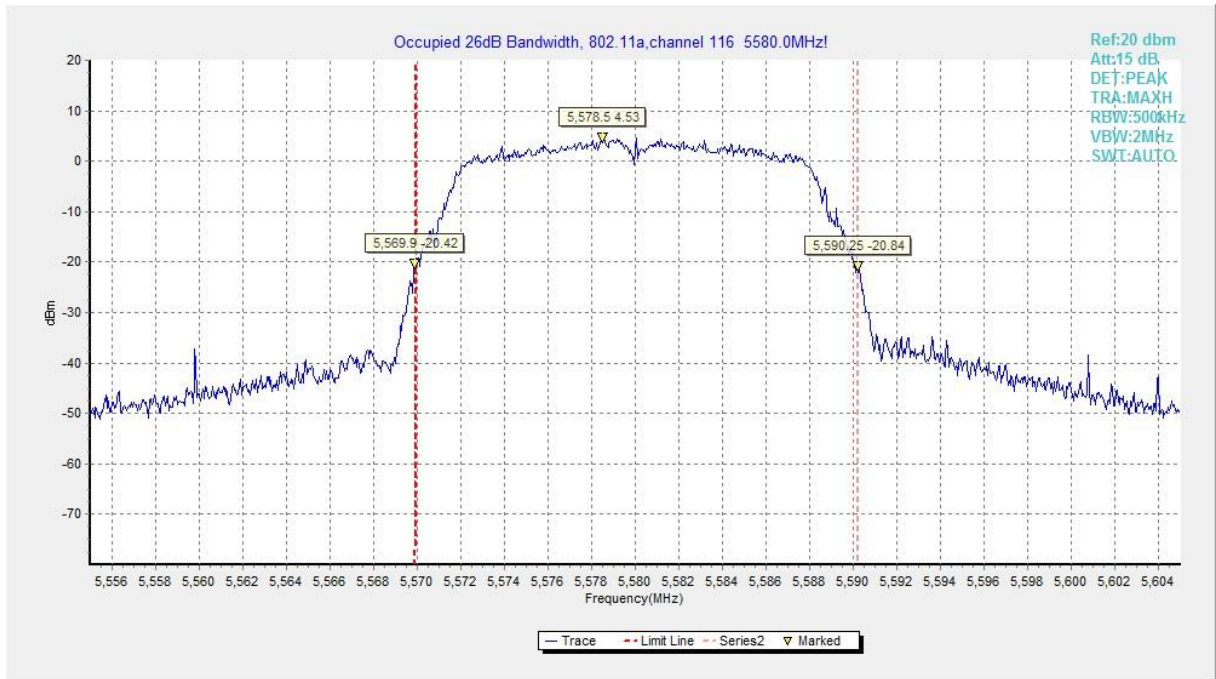


Fig.8 Occupied 26dB Bandwidth (802.11a, 5580MHz)

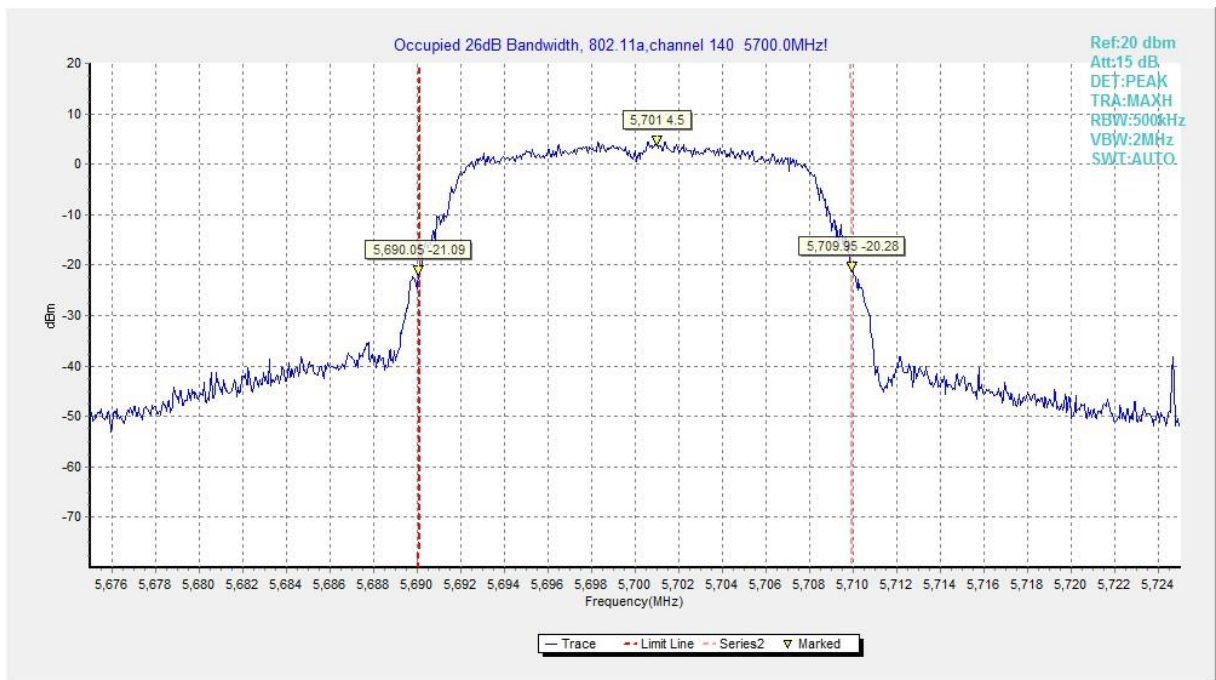


Fig.9 Occupied 26dB Bandwidth (802.11a, 5700MHz)

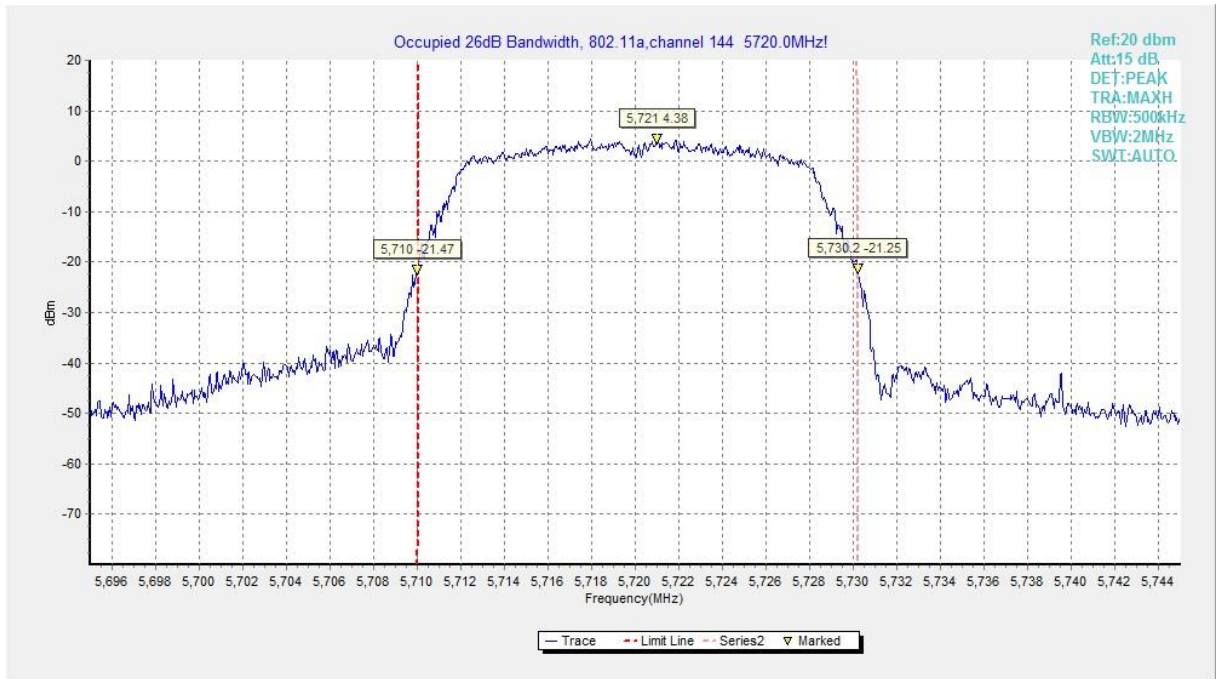


Fig.10 Occupied 26dB Bandwidth (802.11a, 5720MHz)

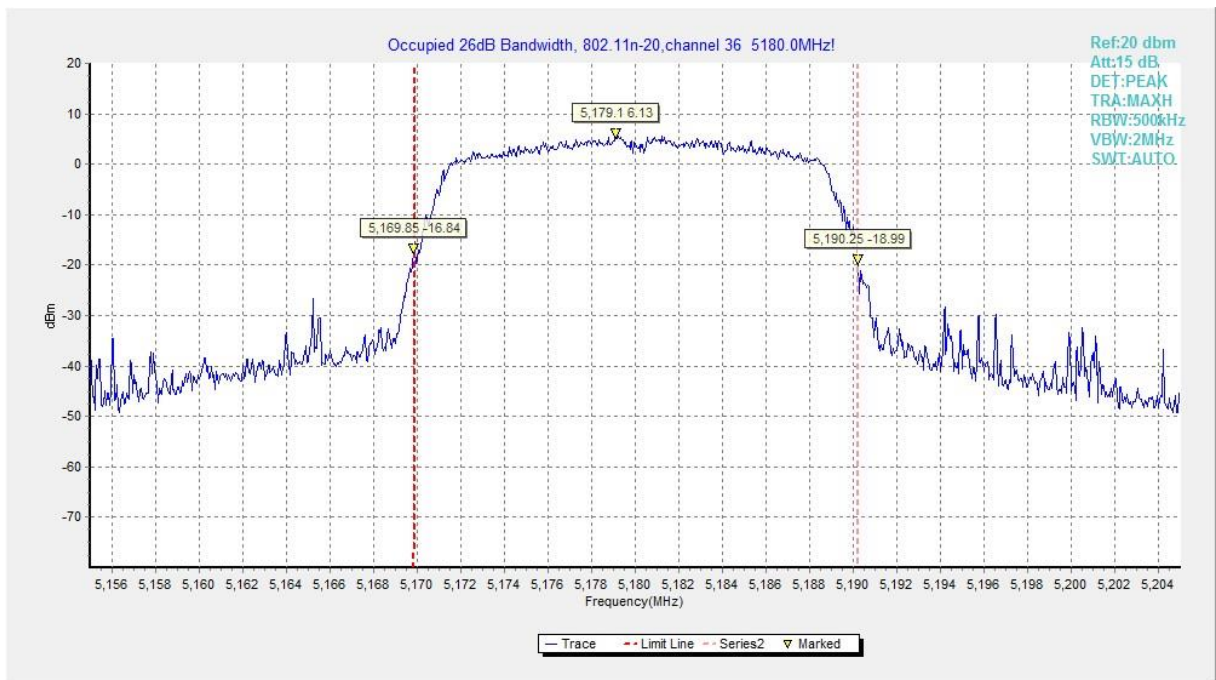


Fig.11 Occupied 26dB Bandwidth (802.11n-HT20, 5180MHz)

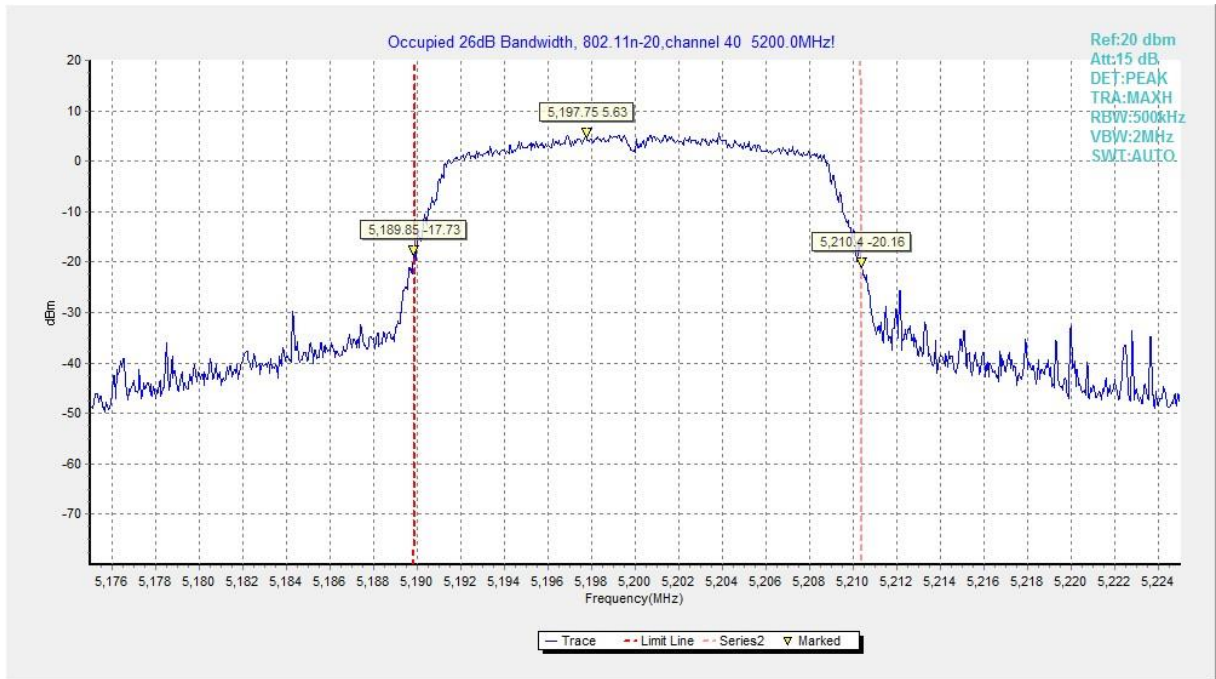


Fig.12 Occupied 26dB Bandwidth (802.11n-HT20, 5200MHz)

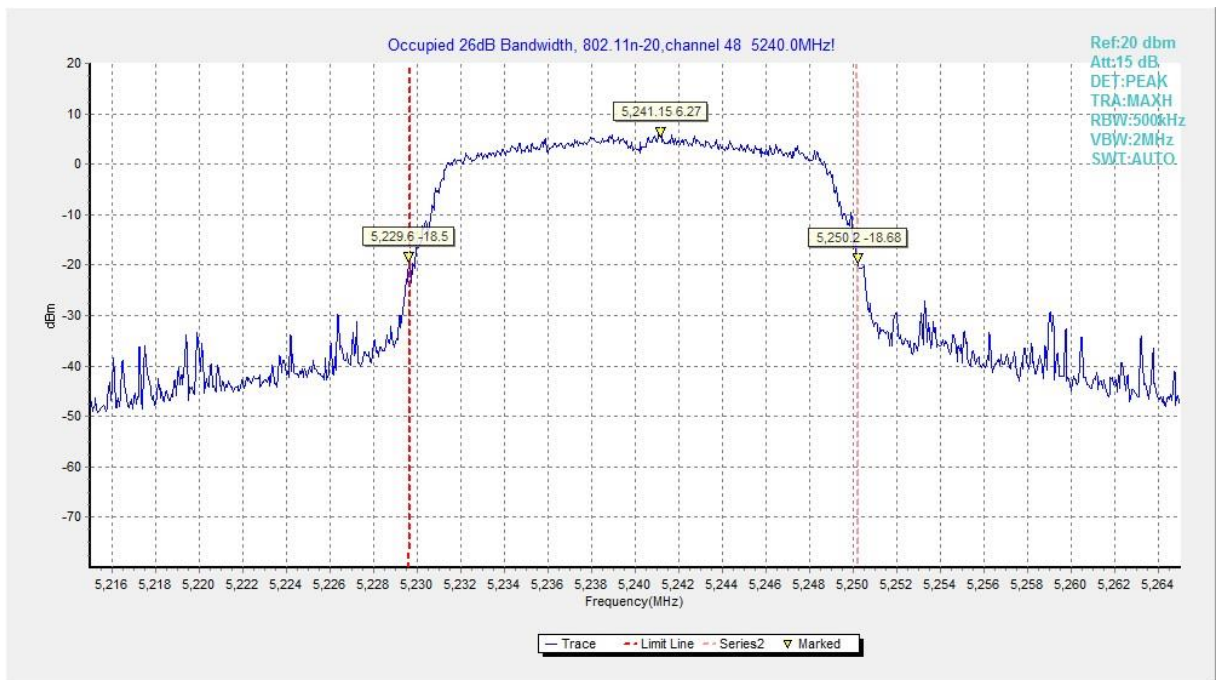


Fig.13 Occupied 26dB Bandwidth (802.11n-HT20, 5240MHz)

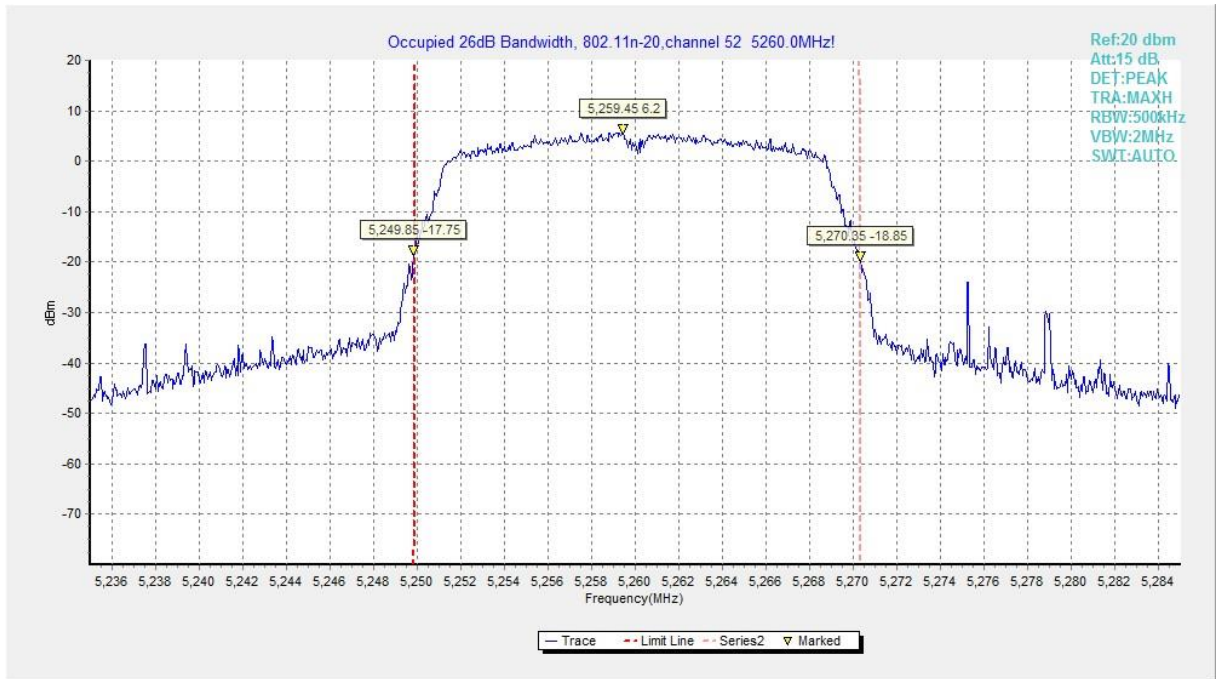


Fig.14 Occupied 26dB Bandwidth (802.11n-HT20, 5260MHz)

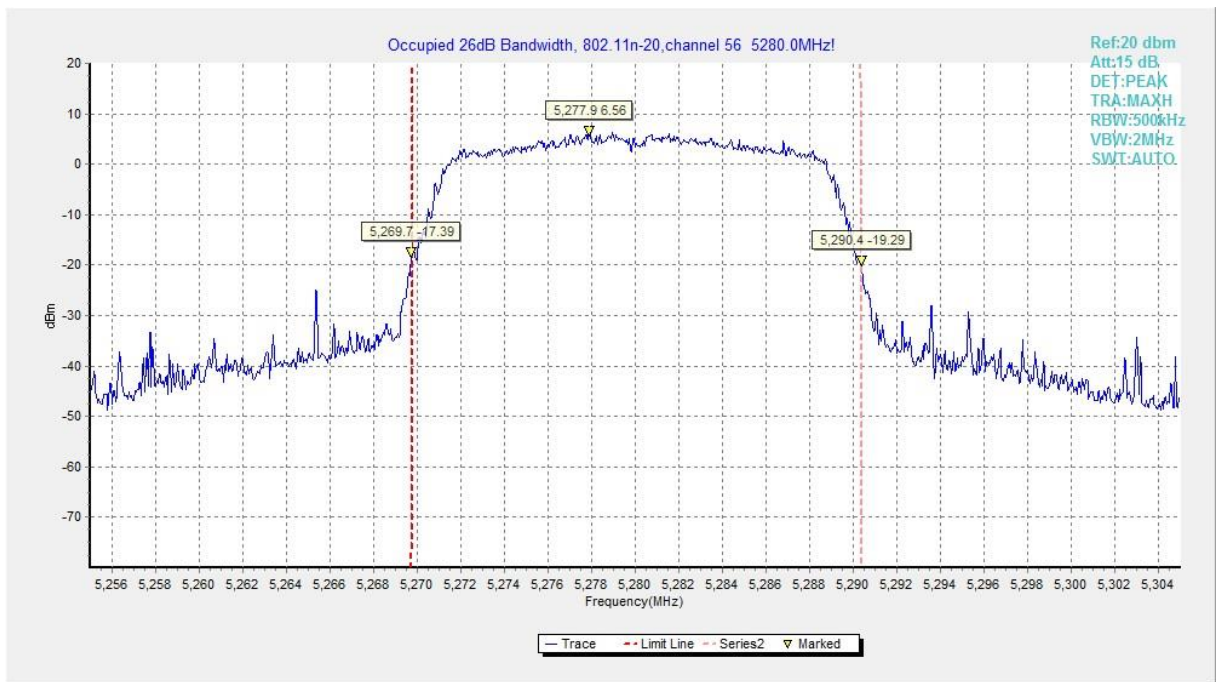


Fig.15 Occupied 26dB Bandwidth (802.11n-HT20, 5280MHz)

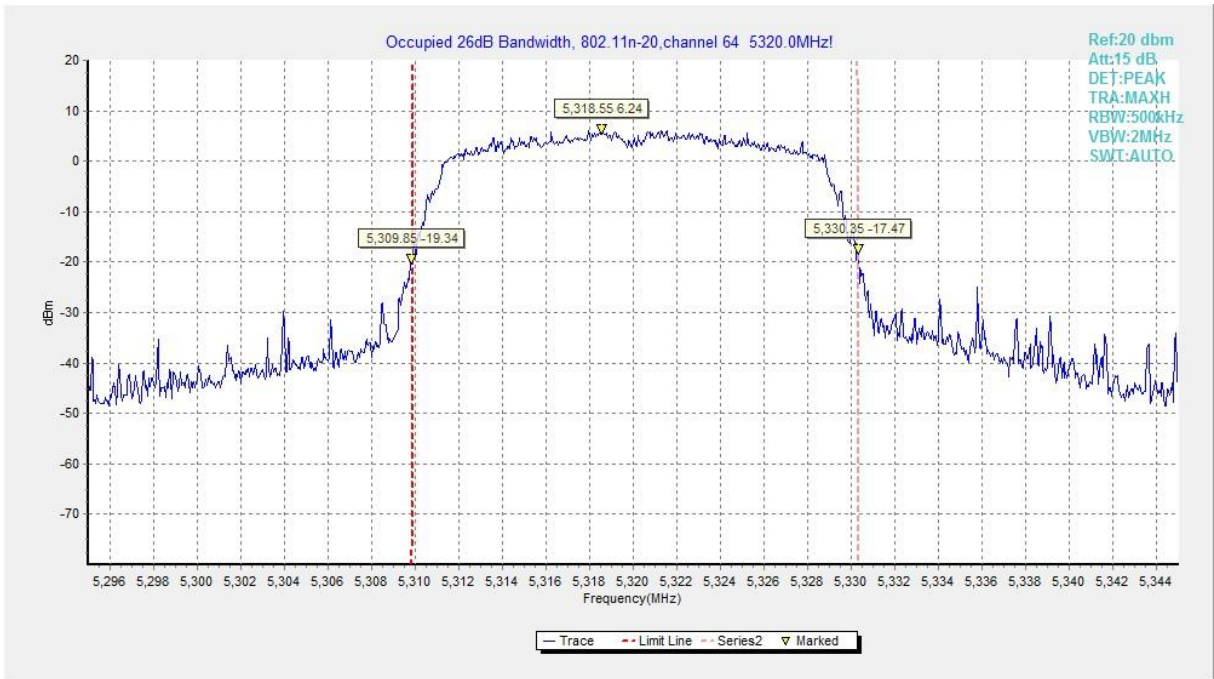


Fig.16 Occupied 26dB Bandwidth (802.11n-HT20, 5320MHz)

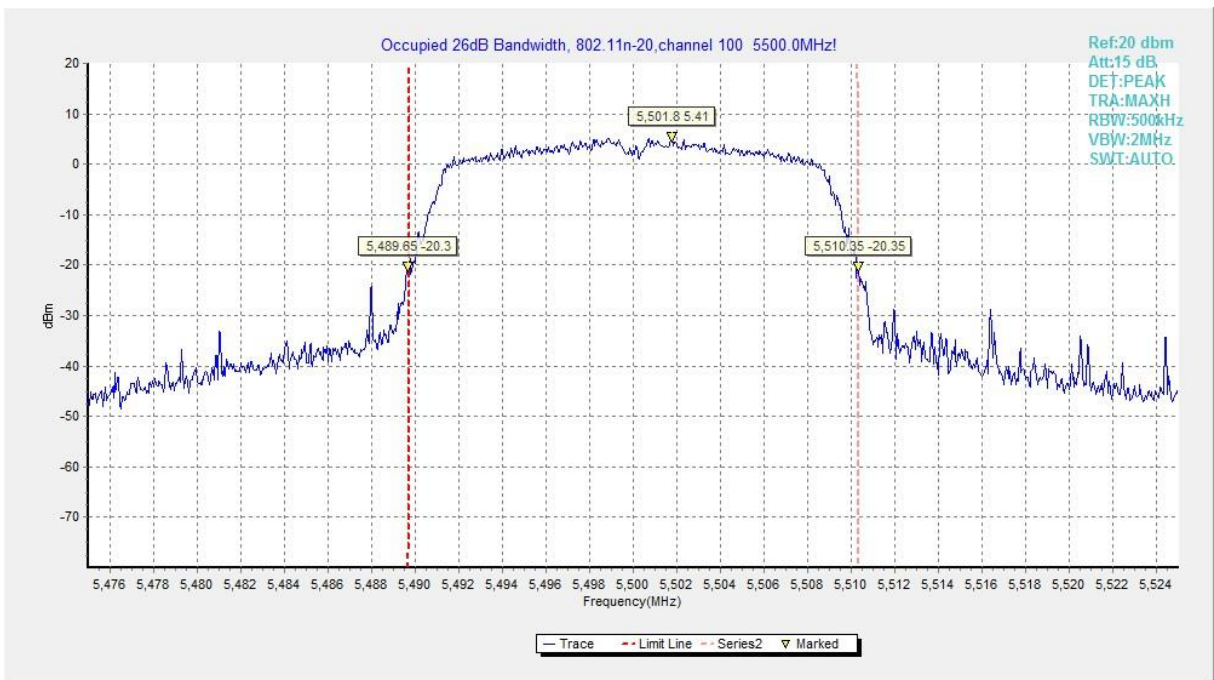


Fig.17 Occupied 26dB Bandwidth (802.11n-HT20, 5500MHz)

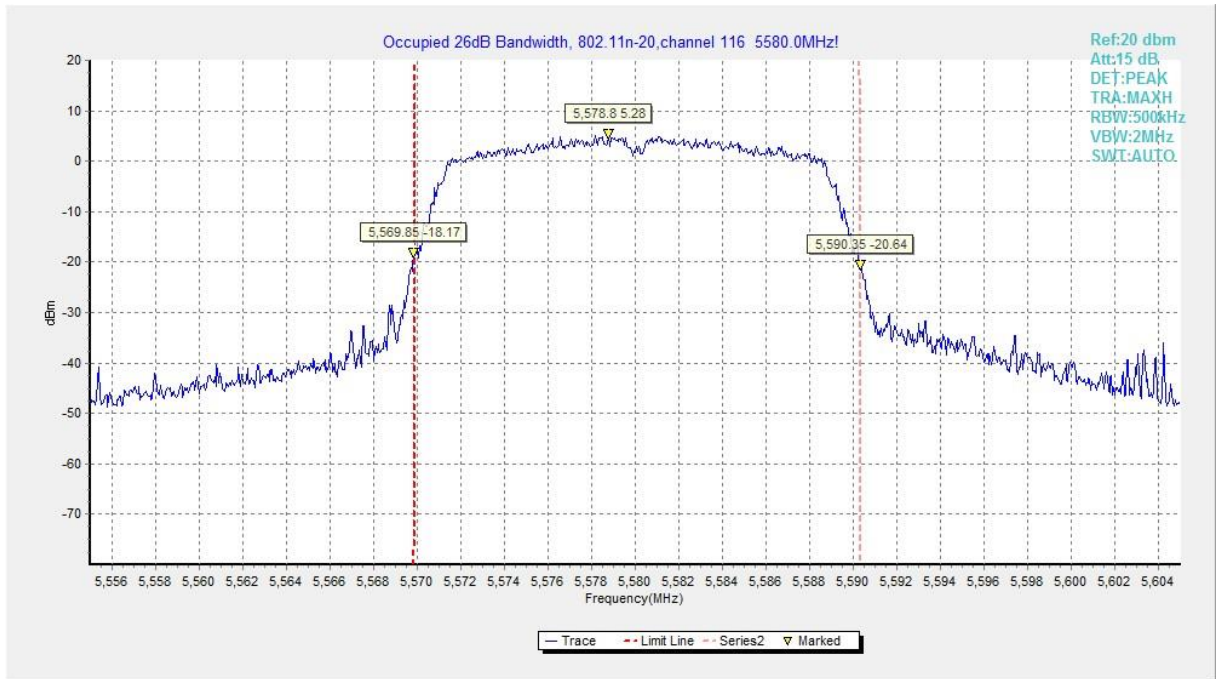


Fig.18 Occupied 26dB Bandwidth (802. 11n-HT20, 5580MHz)

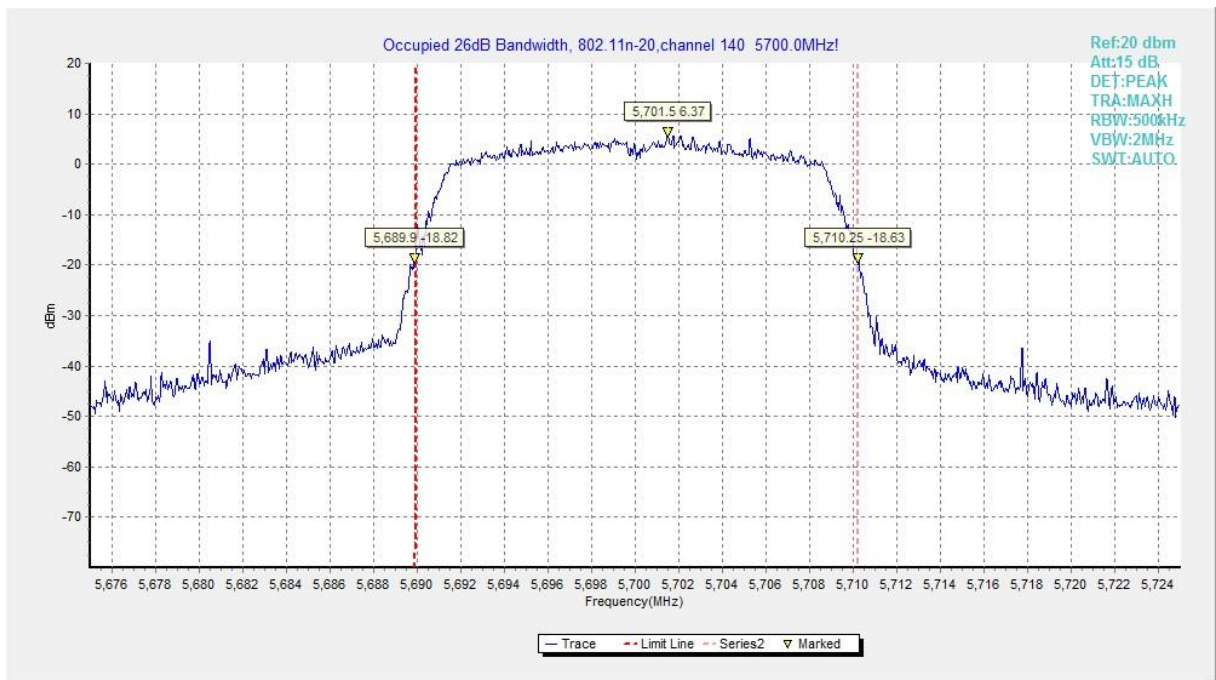


Fig.19 Occupied 26dB Bandwidth (802. 11n-HT20, 5700MHz)

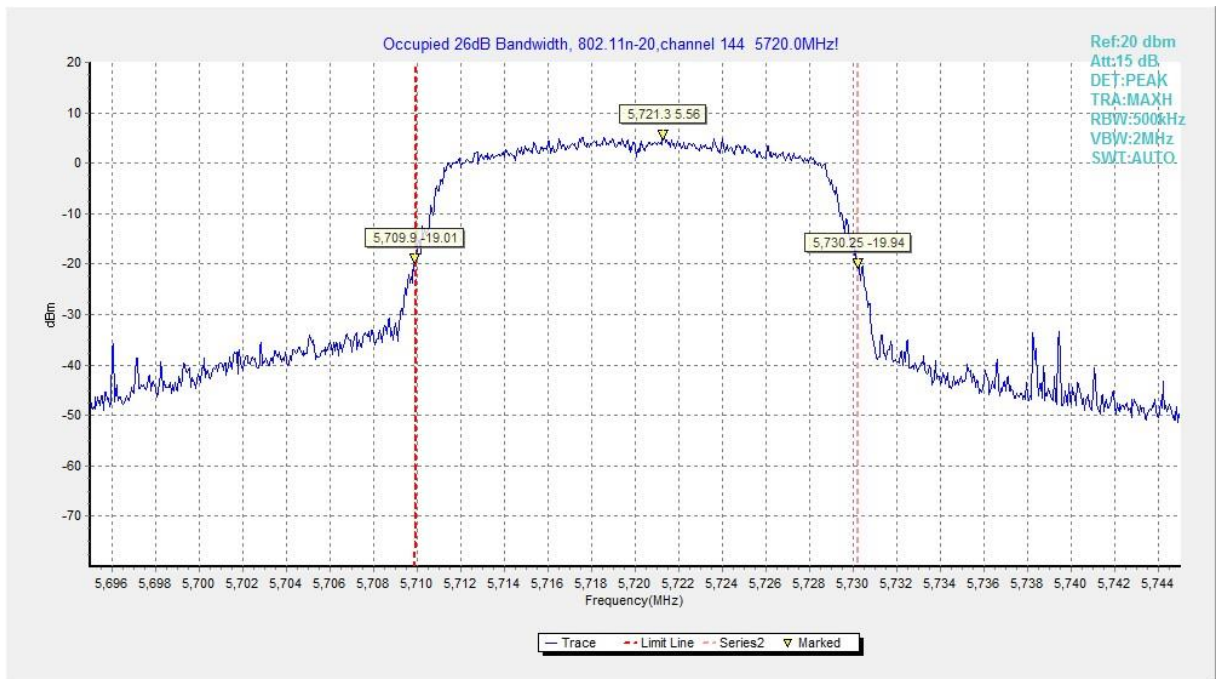


Fig.20 Occupied 26dB Bandwidth (802. 11n-HT20, 5720MHz)

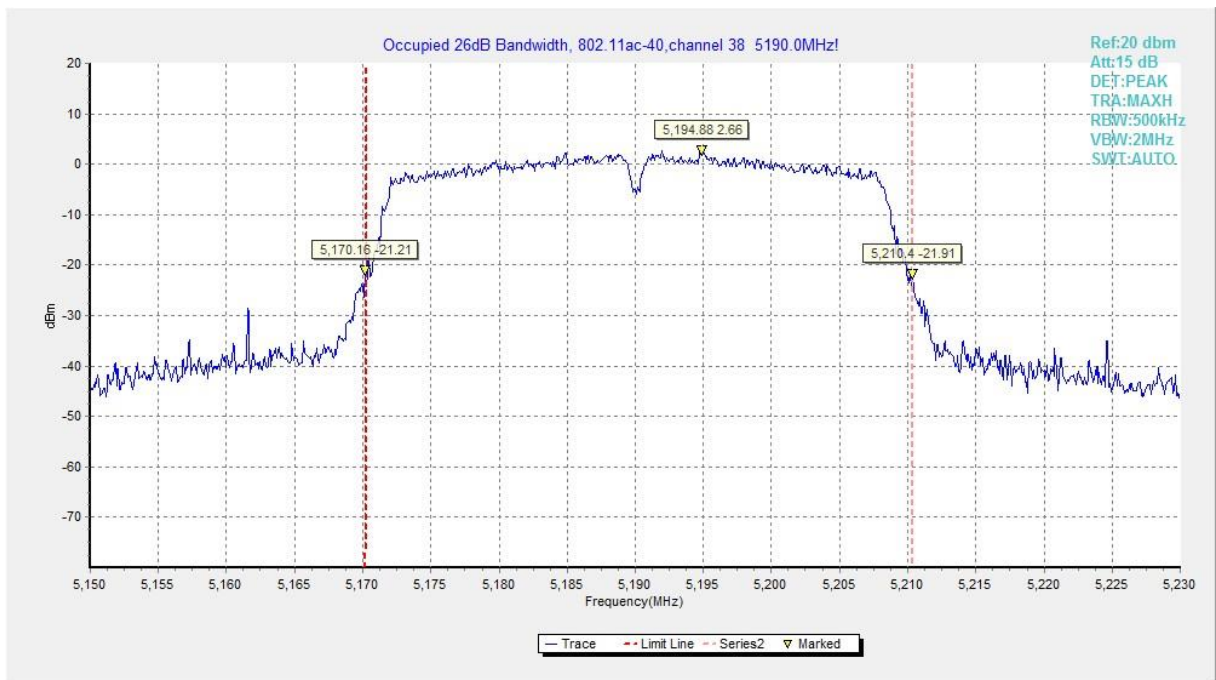


Fig.21 Occupied 26dB Bandwidth (802.11ac-HT40, 5190MHz)

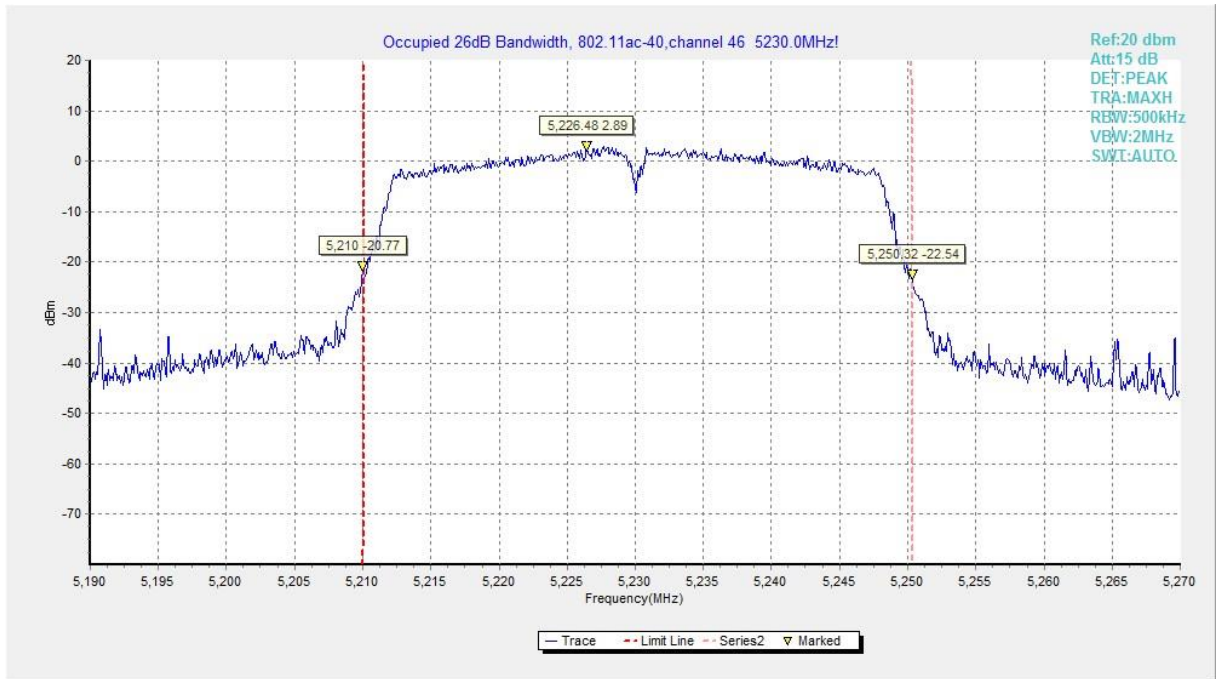


Fig.22 Occupied 26dB Bandwidth (802.11ac-HT40, 5230MHz)

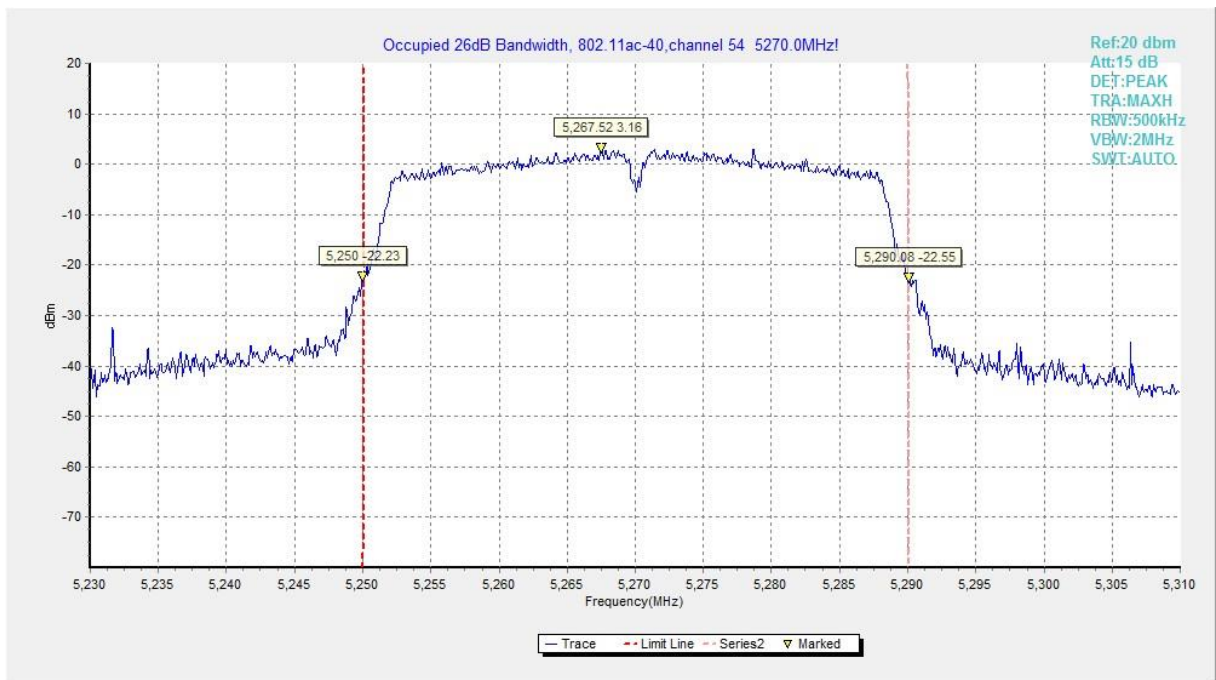


Fig.23 Occupied 26dB Bandwidth (802.11ac-HT40, 5270MHz)

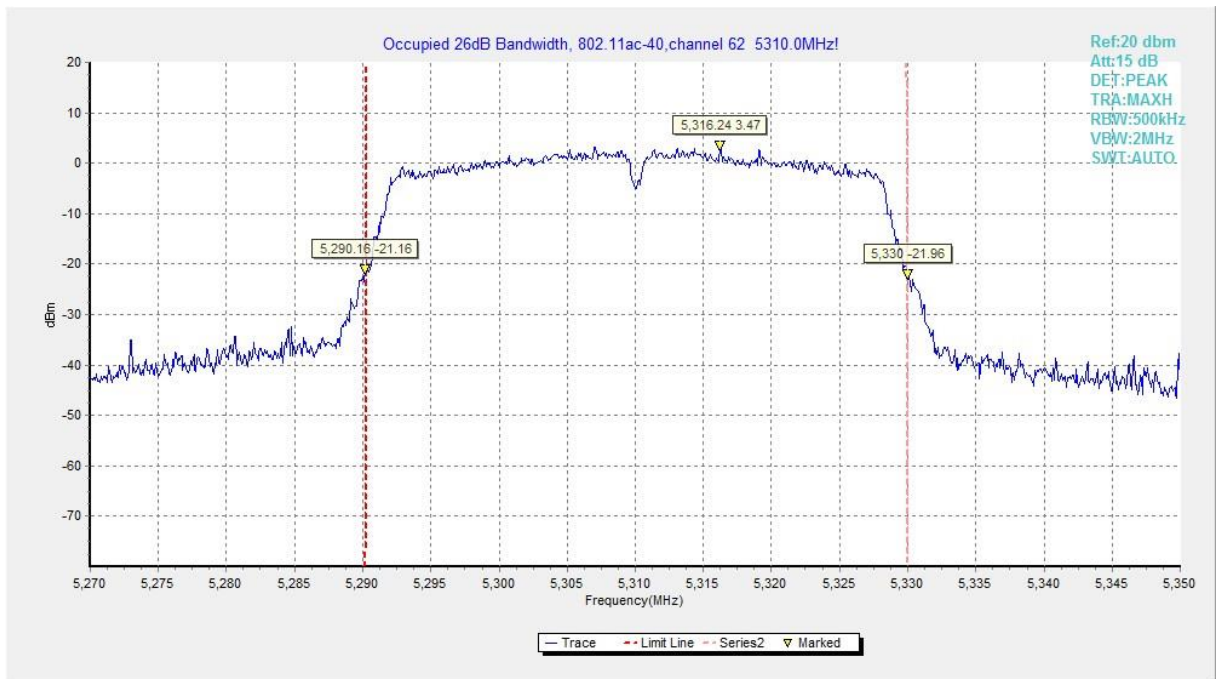


Fig.24 Occupied 26dB Bandwidth (802.11ac-HT40, 5310MHz)

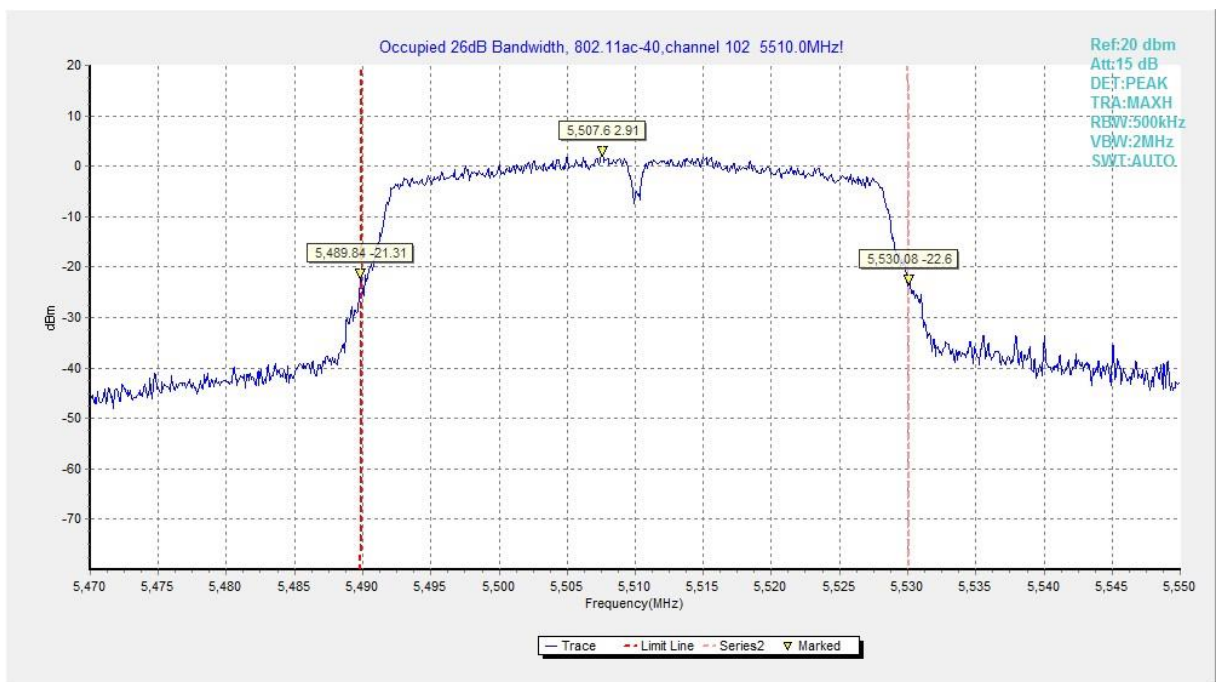


Fig.25 Occupied 26dB Bandwidth (802.11ac-HT40, 5510MHz)

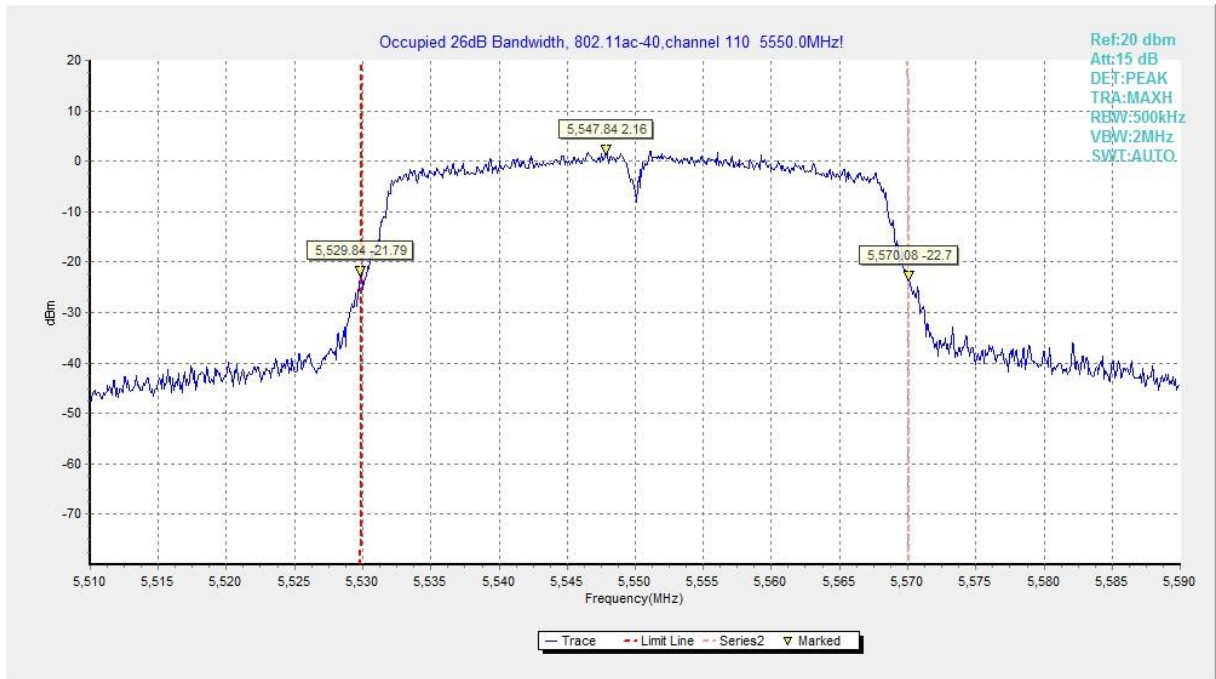


Fig.26 Occupied 26dB Bandwidth (802. 11ac-HT40, 5550MHz)

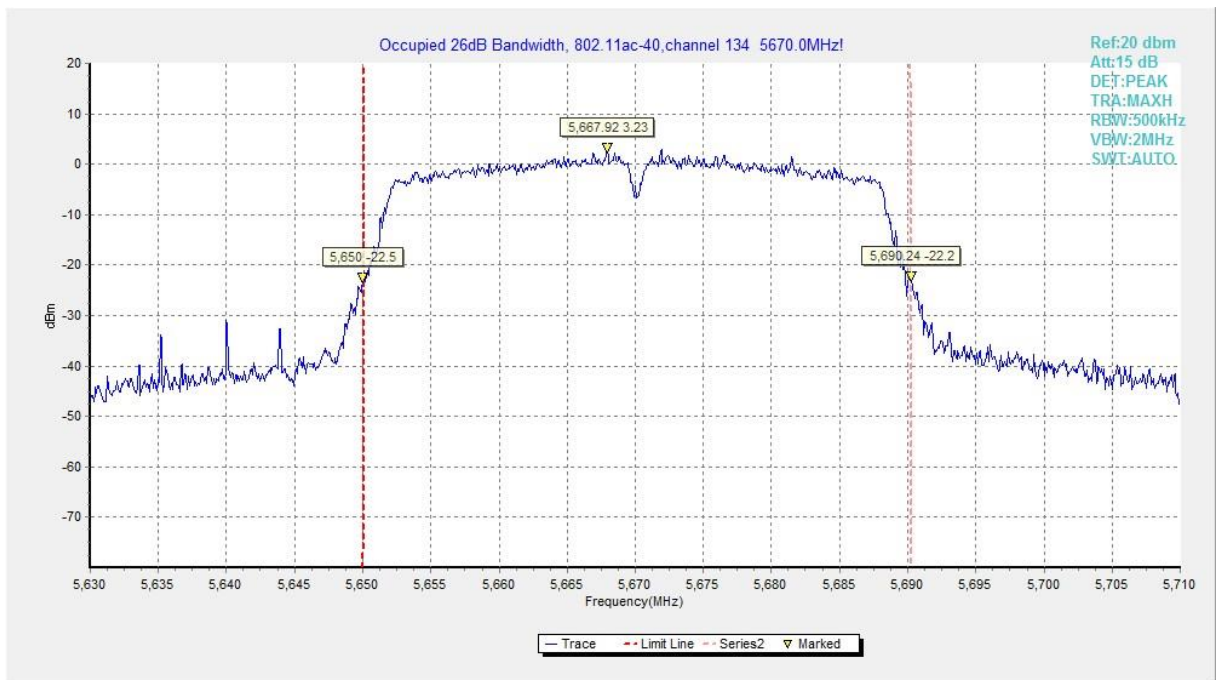


Fig.27 Occupied 26dB Bandwidth (802. 11ac-HT40, 5670MHz)

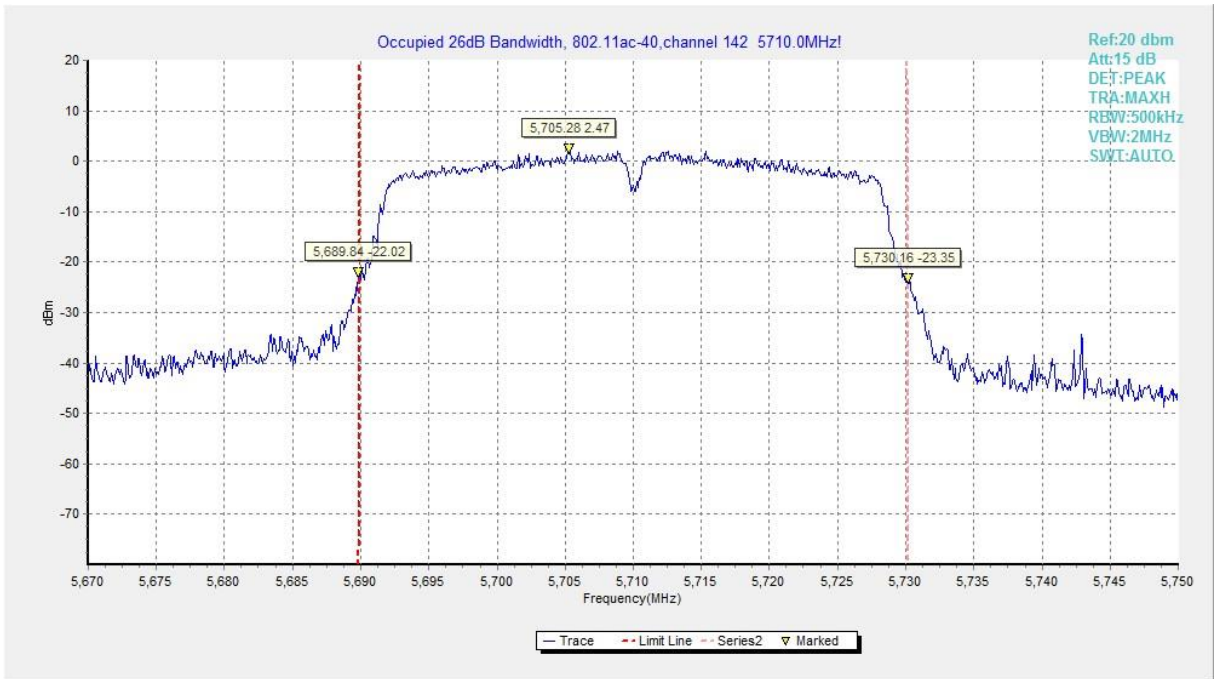


Fig.28 Occupied 26dB Bandwidth (802. 11ac-HT40, 5710MHz)

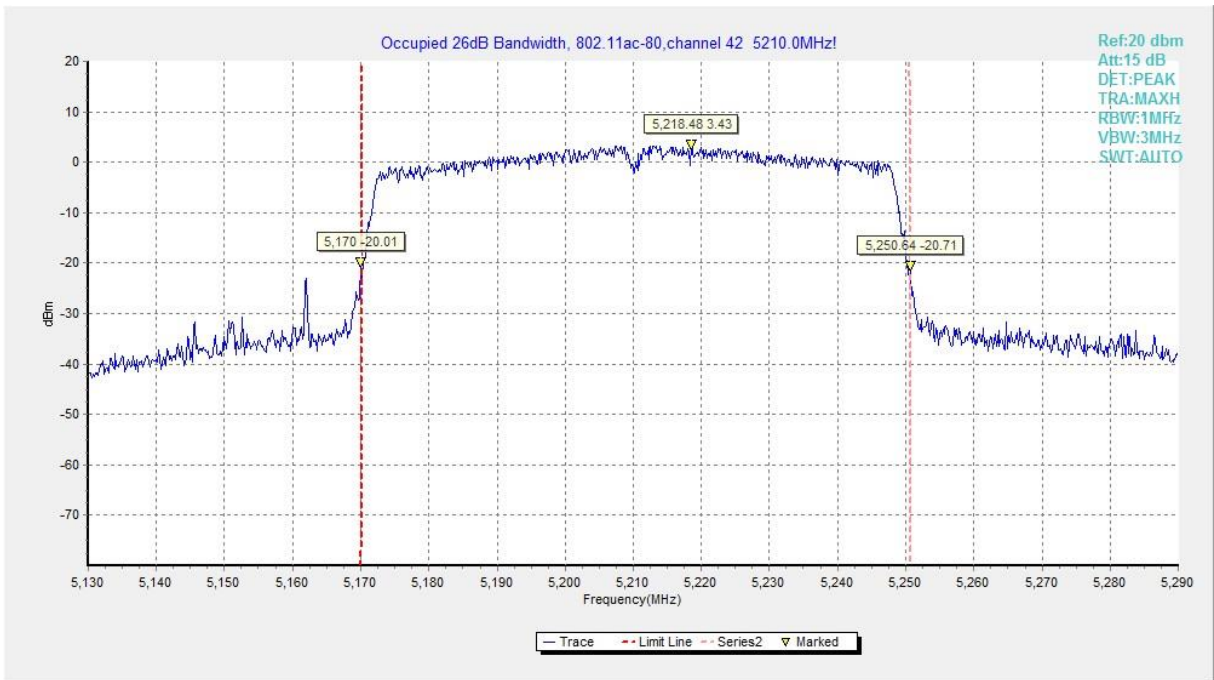


Fig.29 Occupied 26dB Bandwidth (802. 11ac-HT80, 5210MHz)

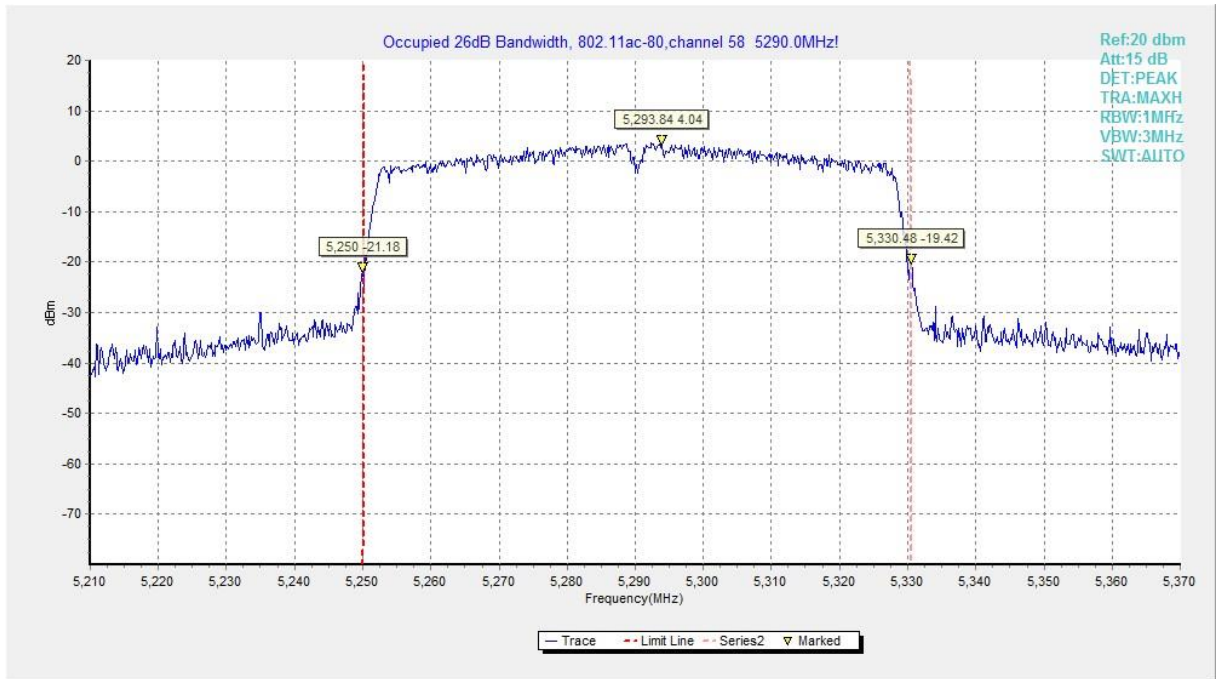


Fig.30 Occupied 26dB Bandwidth (802. 11ac-HT80, 5290MHz)

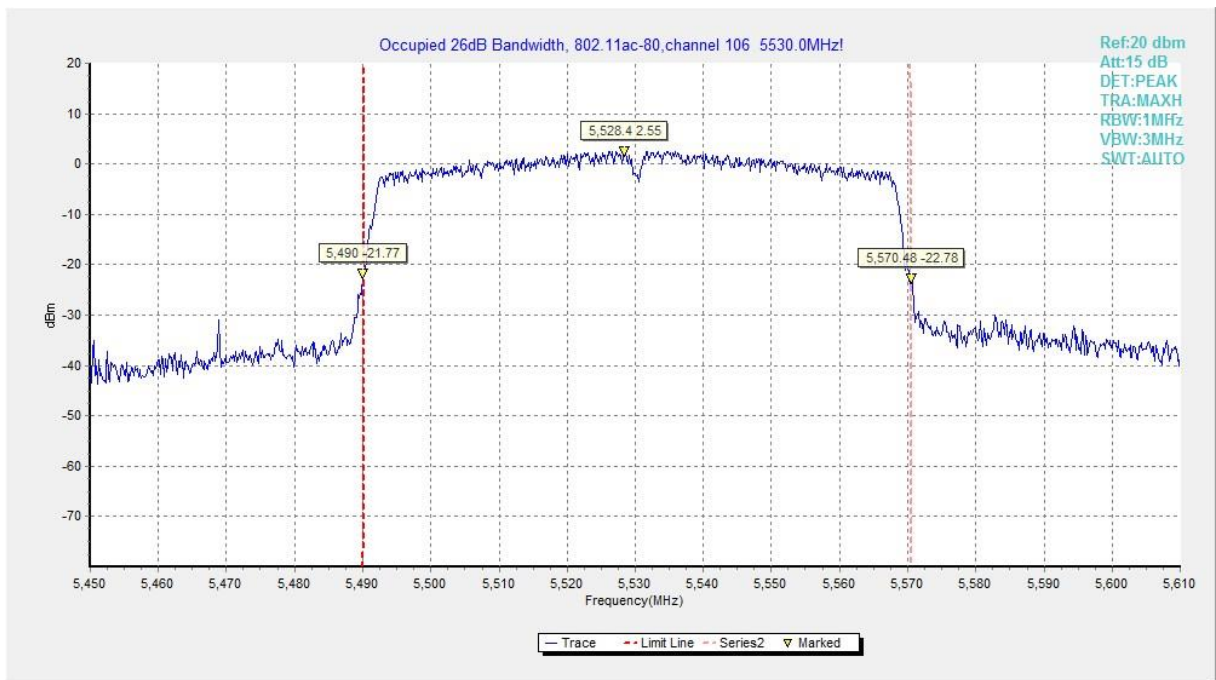


Fig.31 Occupied 26dB Bandwidth (802. 11ac-HT80, 5530MHz)

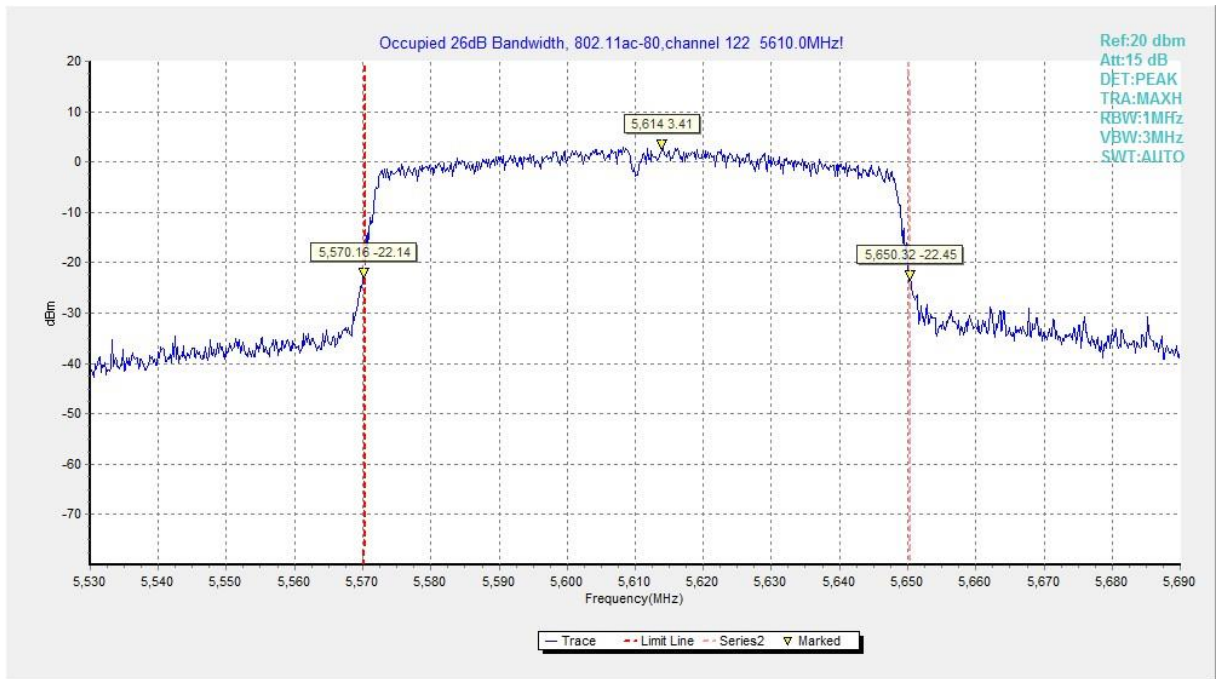


Fig.32 Occupied 26dB Bandwidth (802.11ac-HT80, 5610MHz)

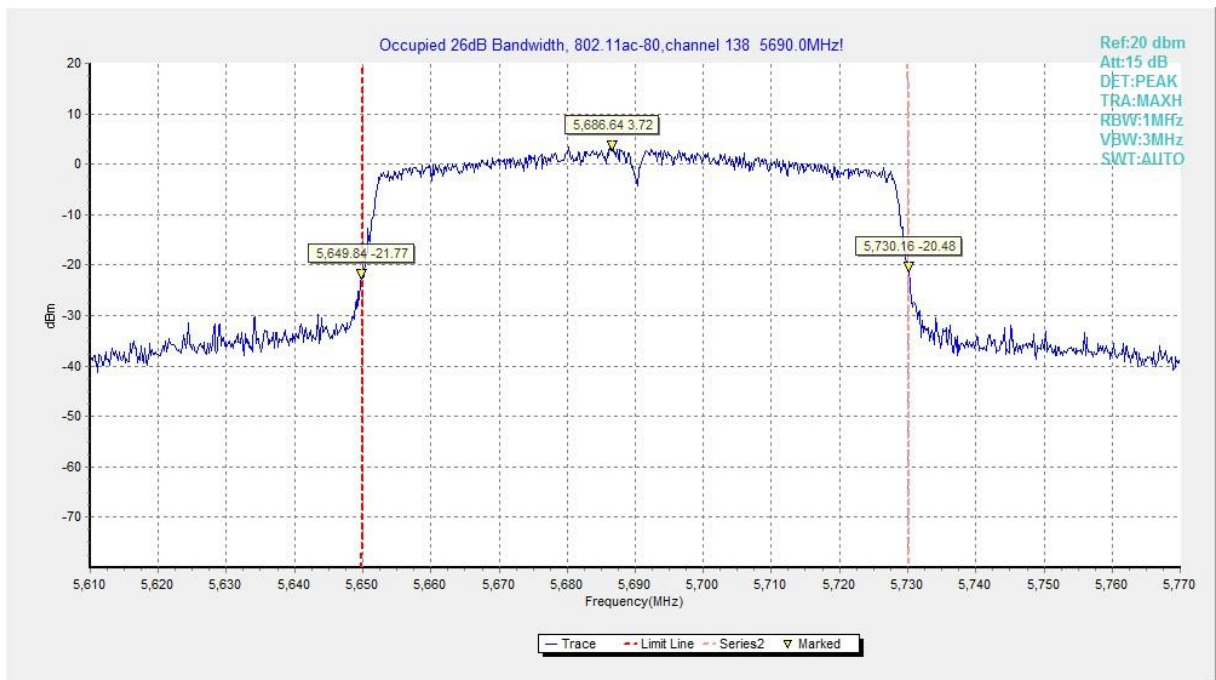


Fig.33 Occupied 26dB Bandwidth (802.11ac-HT80, 5690MHz)

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)
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

Sample Calculations

1. Convert the resultant EIRP level to an equivalent electric field strength using the following relationship:

$$E = \text{EIRP} - 20 \log(D) + 104.77 \quad \text{Where:}$$

E is the field strength in dB μ V/m

D is the measurement distance in meters

EIRP is the equivalent isotropically radiated power in dbm

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:

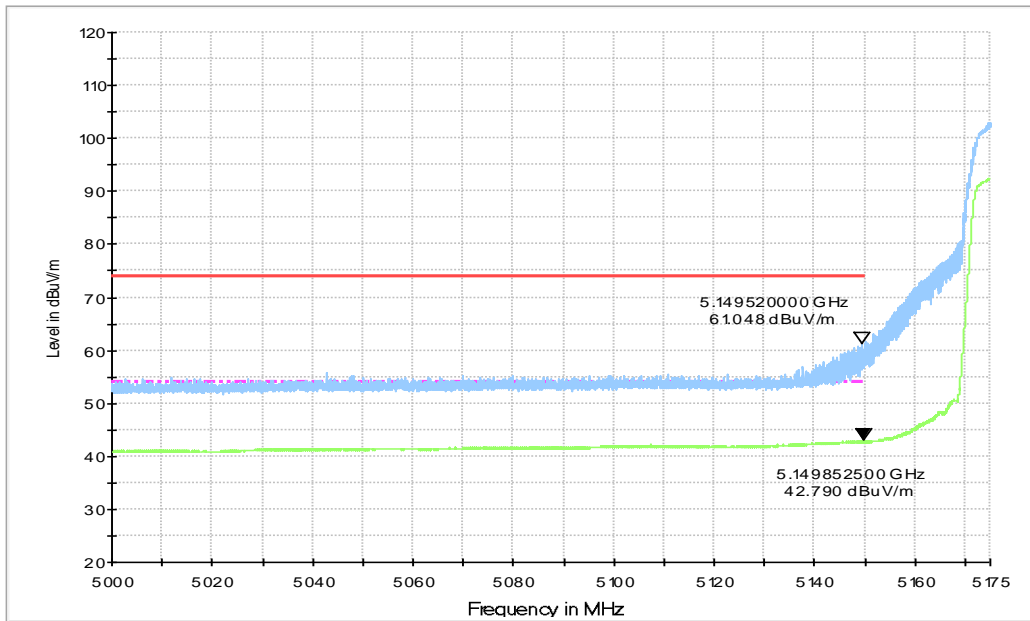


Fig.34 Band Edges (802.11a Ch36, 5180MHz)

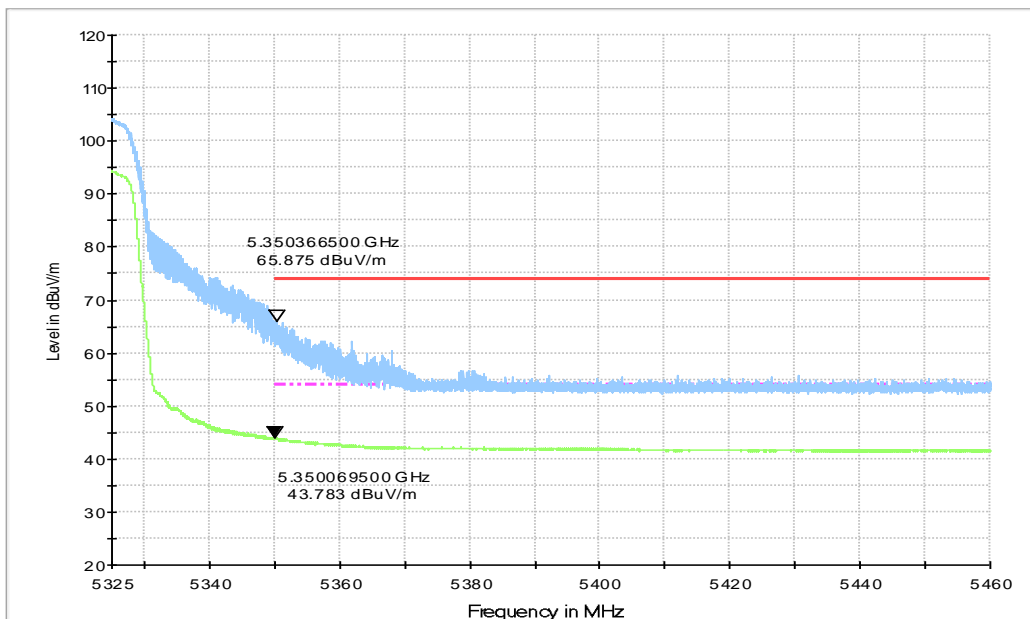


Fig.35 Band Edges (802.11a Ch64, 5320MHz)

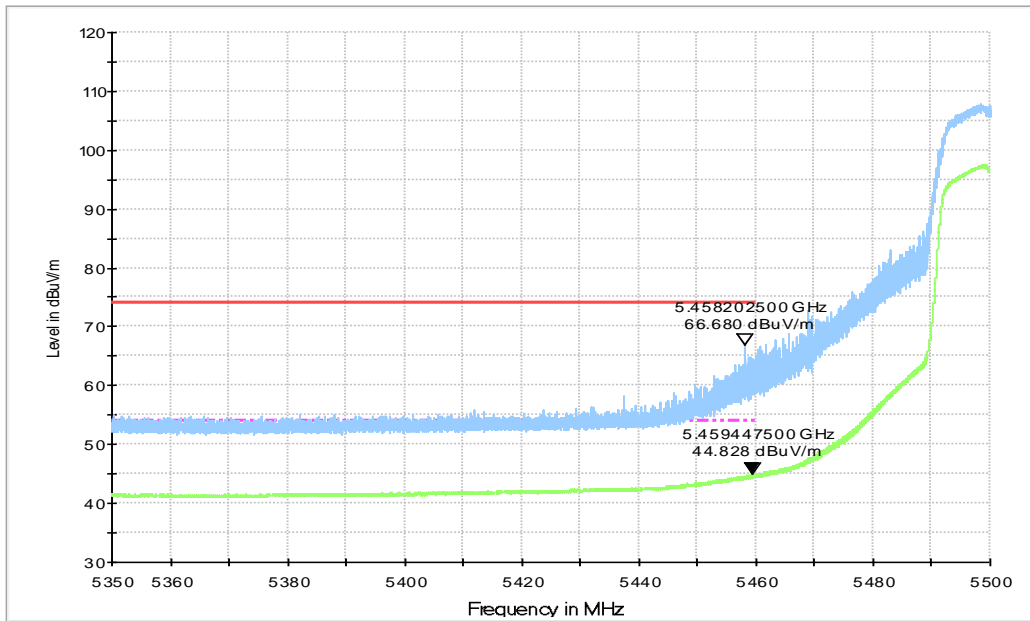


Fig.36 Band Edges (802.11a Ch100, 5500MHz)

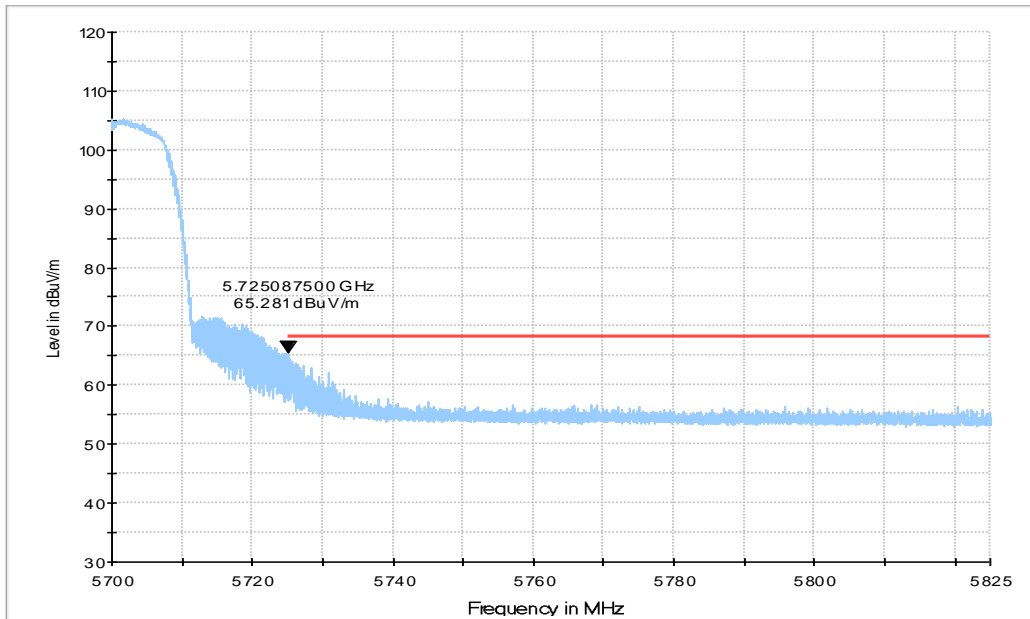


Fig.37 Band Edges (802.11a Ch140, 5700MHz)

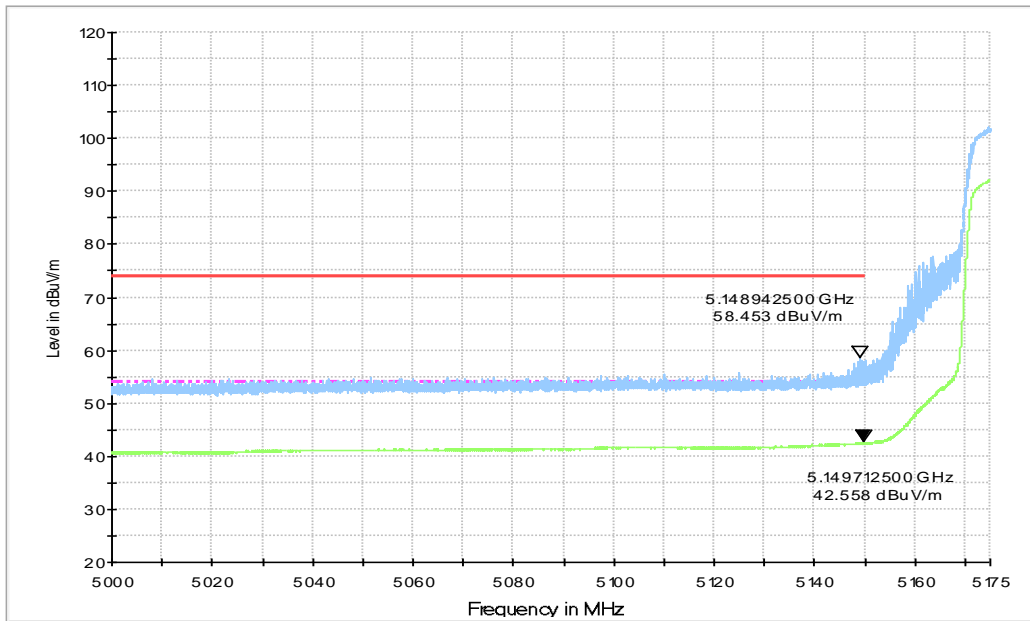


Fig.38 Band Edges (802.11n-HT20 Ch36, 5180MHz)

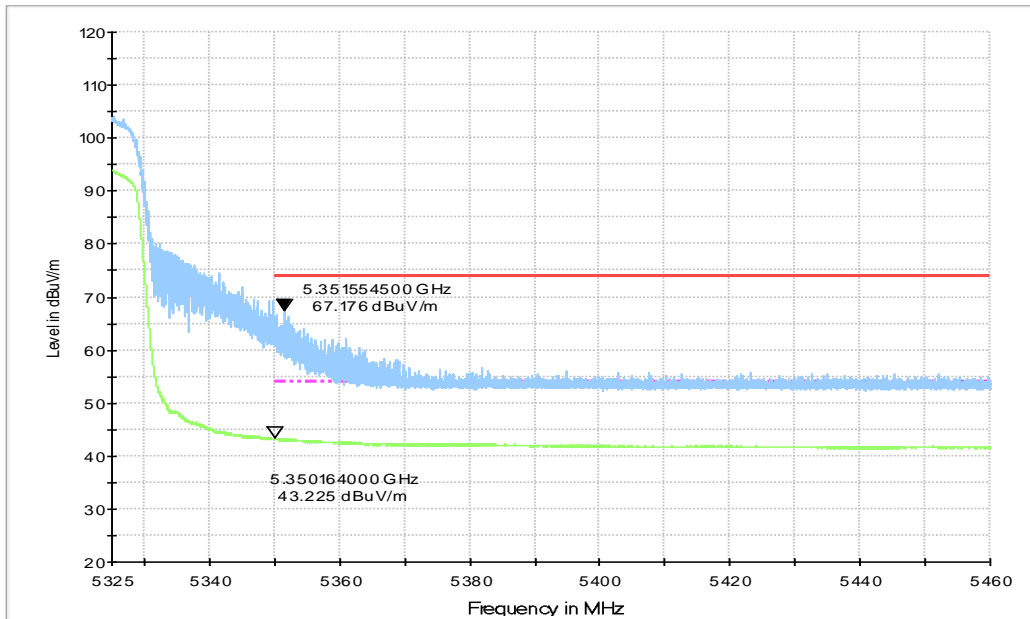


Fig.39 Band Edges (802.11n-HT20 Ch64, 5320MHz)

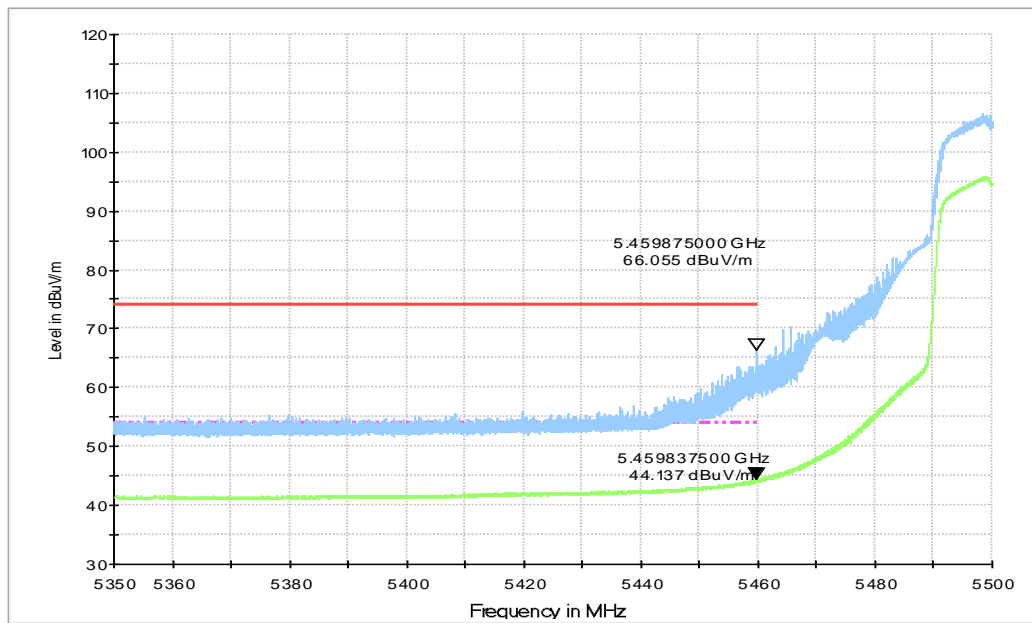


Fig.40 Band Edges (802.11n-HT20 Ch100, 5500MHz)

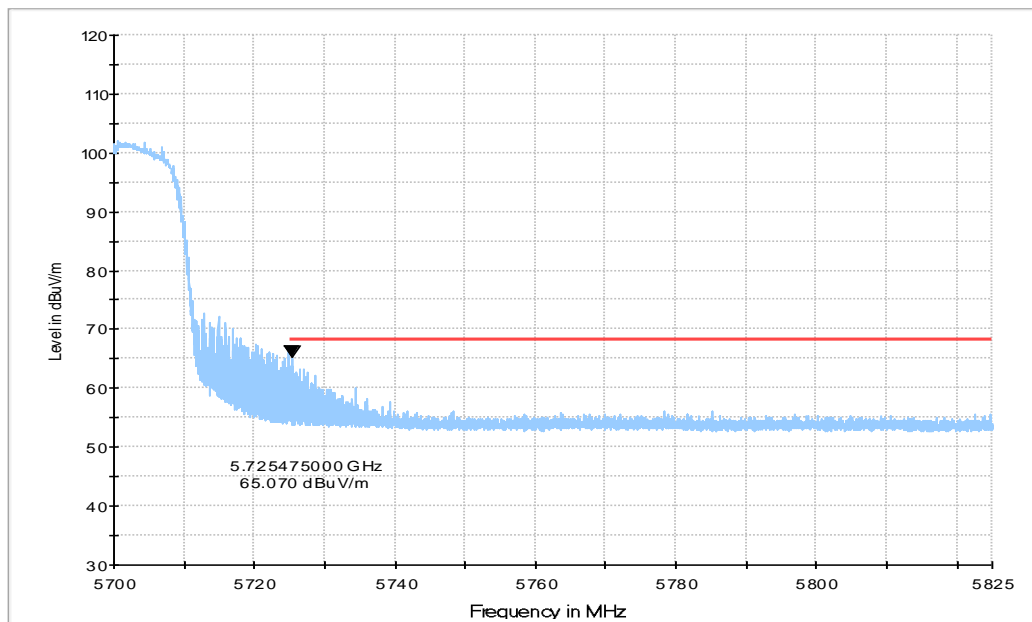


Fig.41 Band Edges (802.11n-HT20 Ch140, 5700MHz)

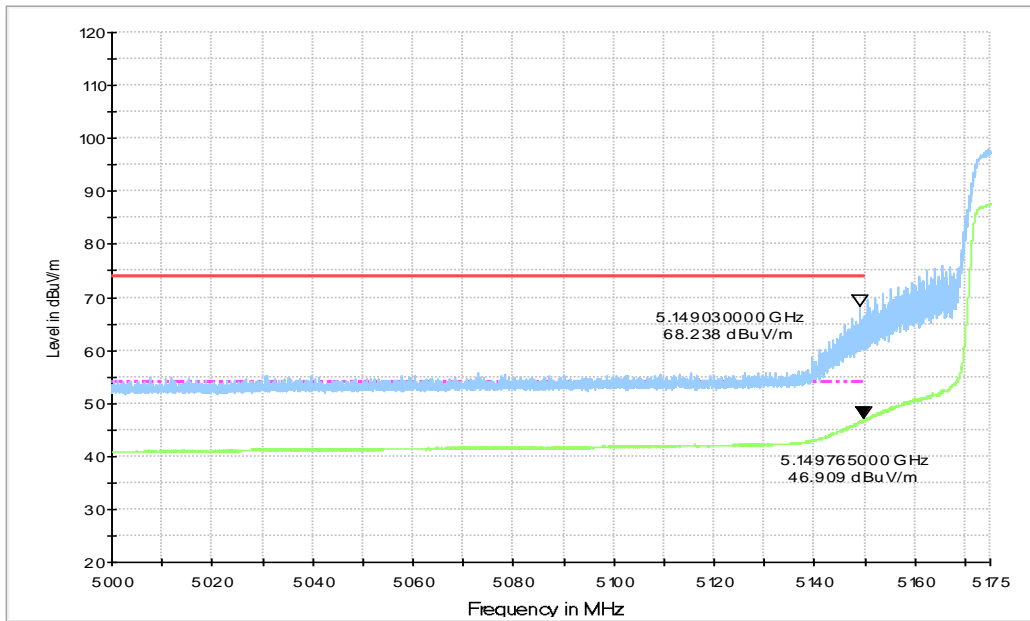


Fig.42 Band Edges (802.11n-HT40 Ch38, 5190MHz)

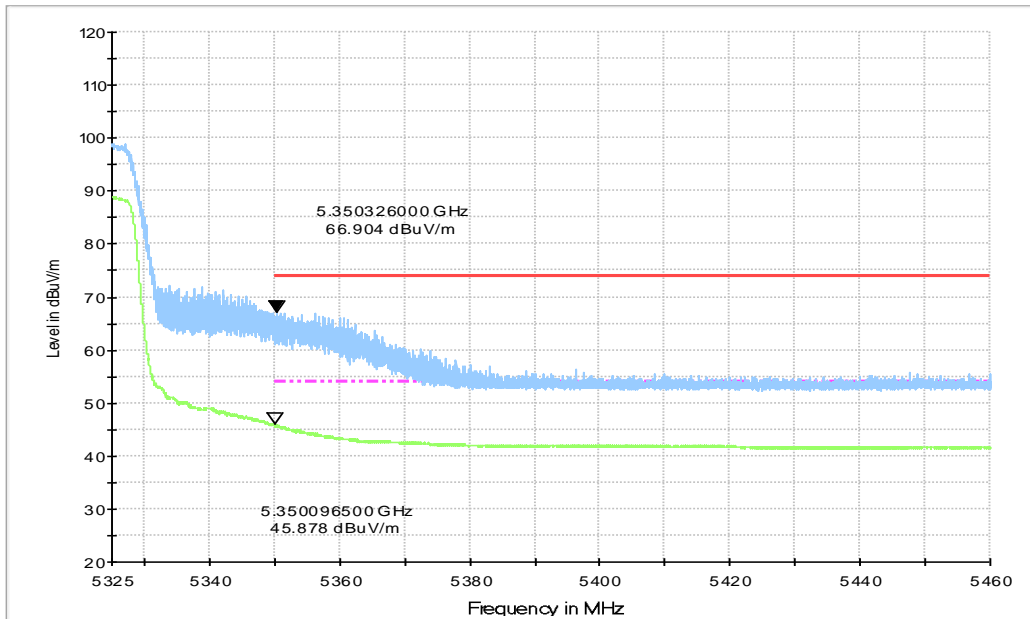


Fig.43 Band Edges (802.11n-HT40 Ch62, 5310MHz)

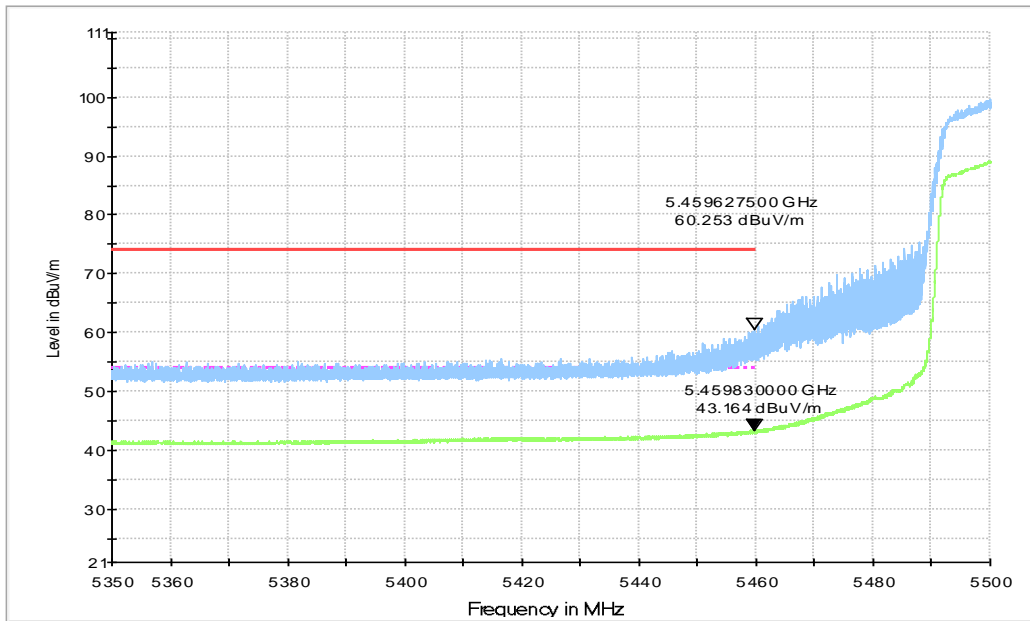


Fig.44 Band Edges (802.11n-HT40 Ch102, 5510MHz)

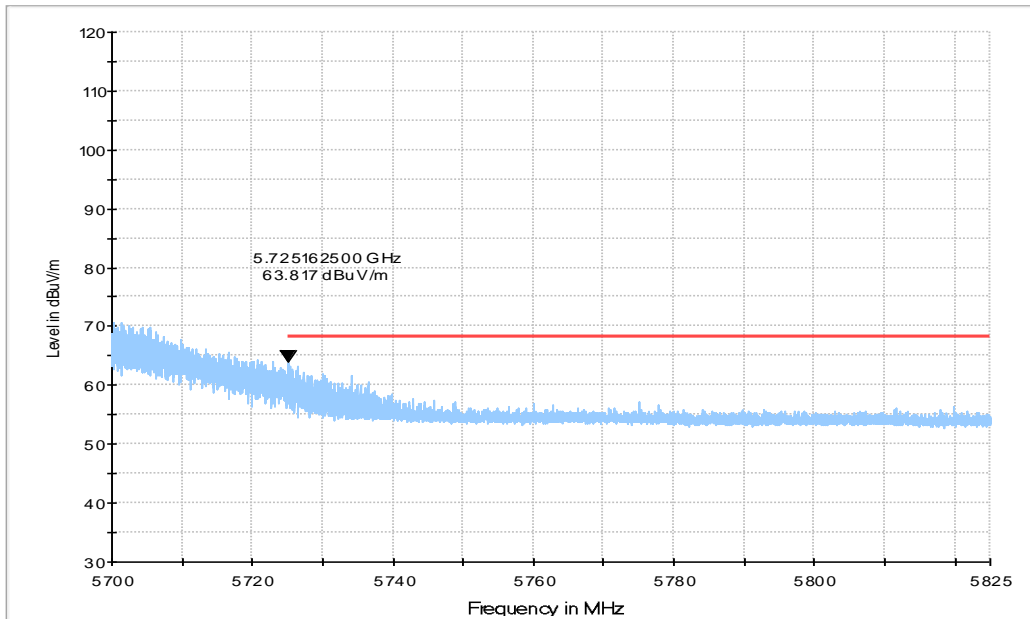


Fig.45 Band Edges (802.11n-HT40 Ch134, 5670MHz)

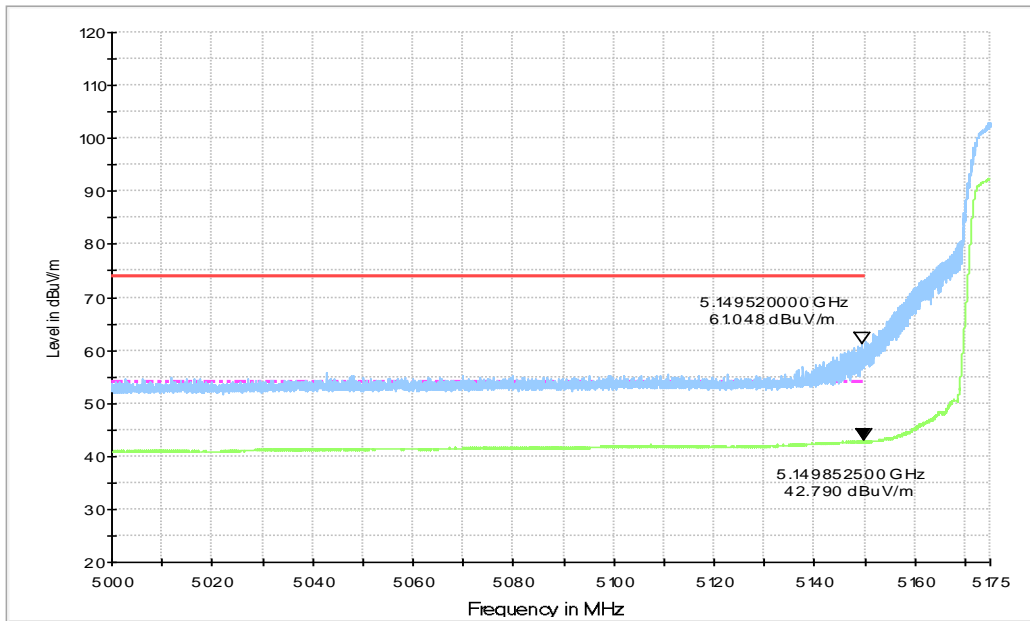


Fig.46 Band Edges (802.11ac-HT20 Ch36, 5180MHz)

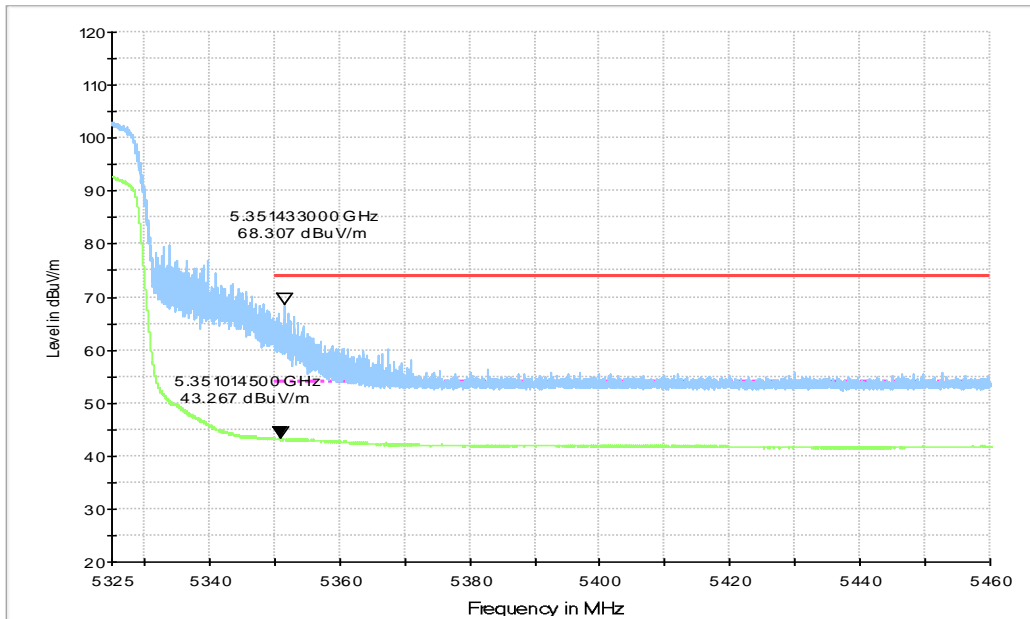


Fig.47 Band Edges (802.11ac-HT20 Ch64, 5320MHz)

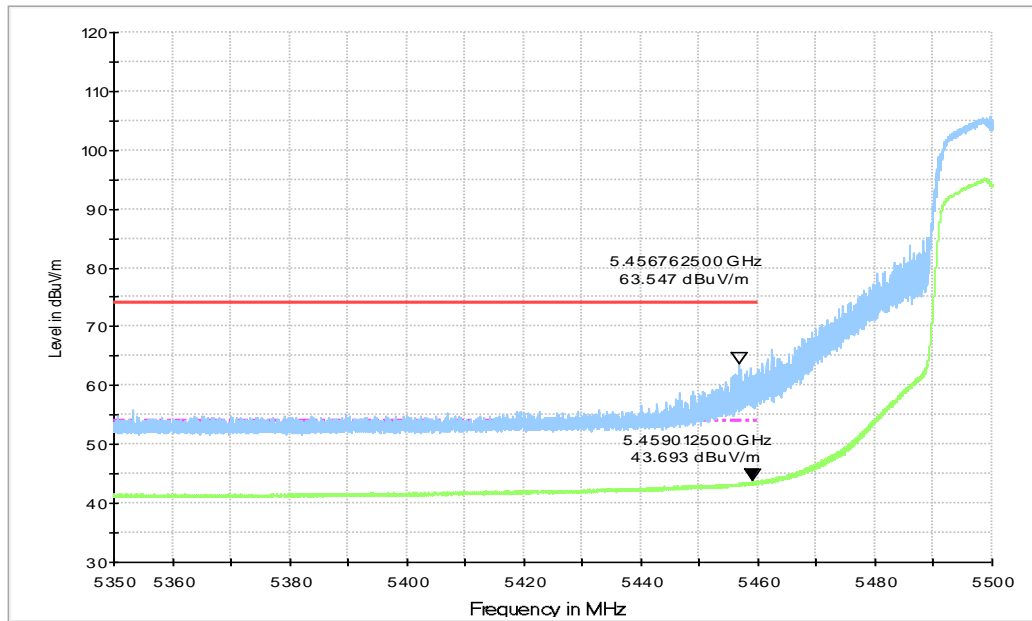


Fig.48 Band Edges (802.11ac-HT20 Ch100, 5500MHz)

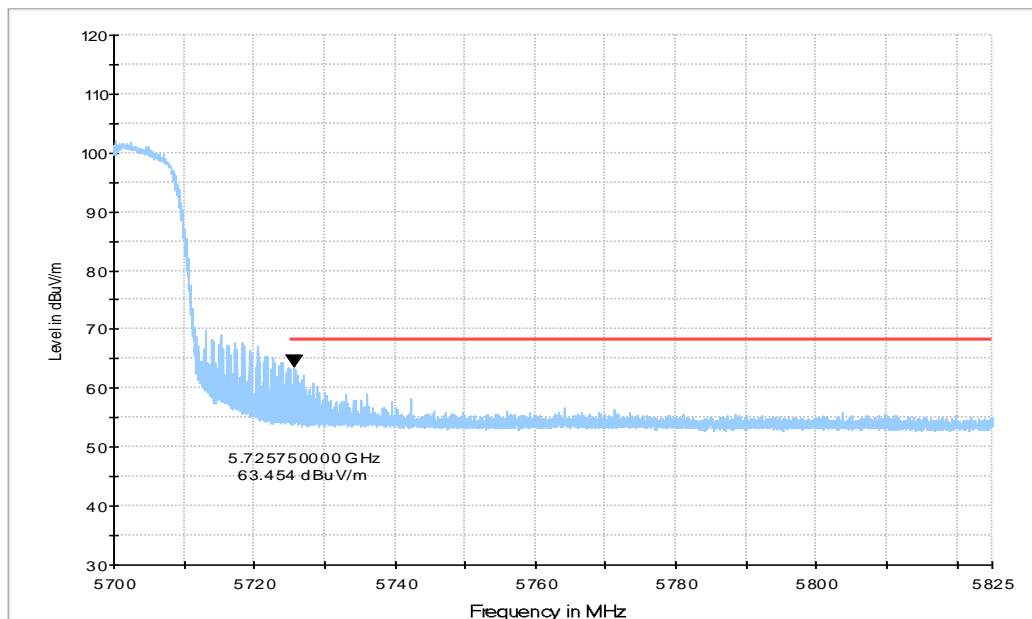


Fig.49 Band Edges (802.11ac-HT20 Ch140, 5700MHz)

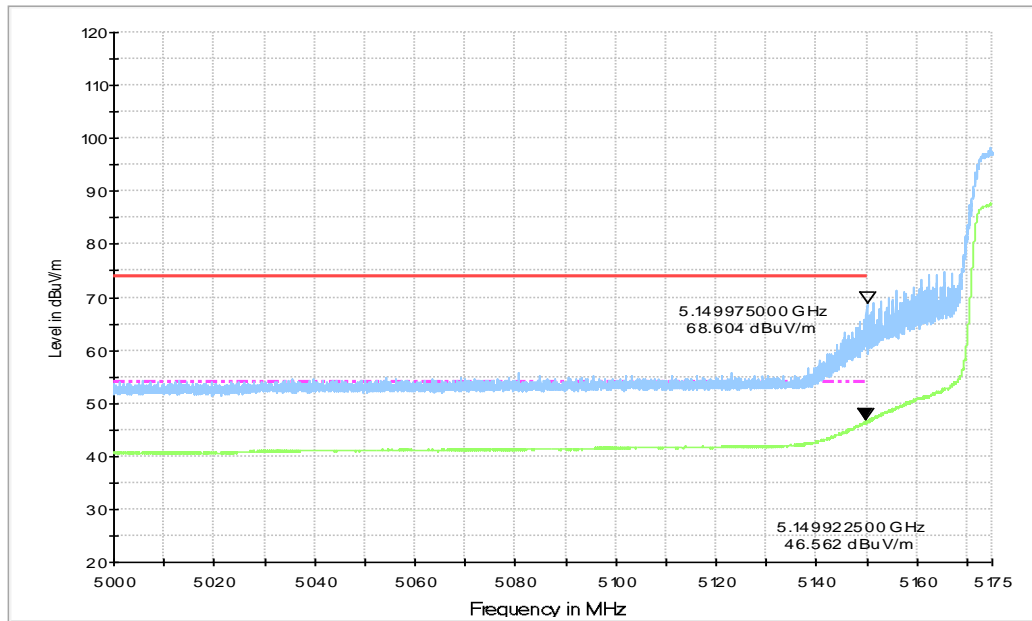


Fig.50 Band Edges (802.11ac-HT40 Ch38, 5190MHz)

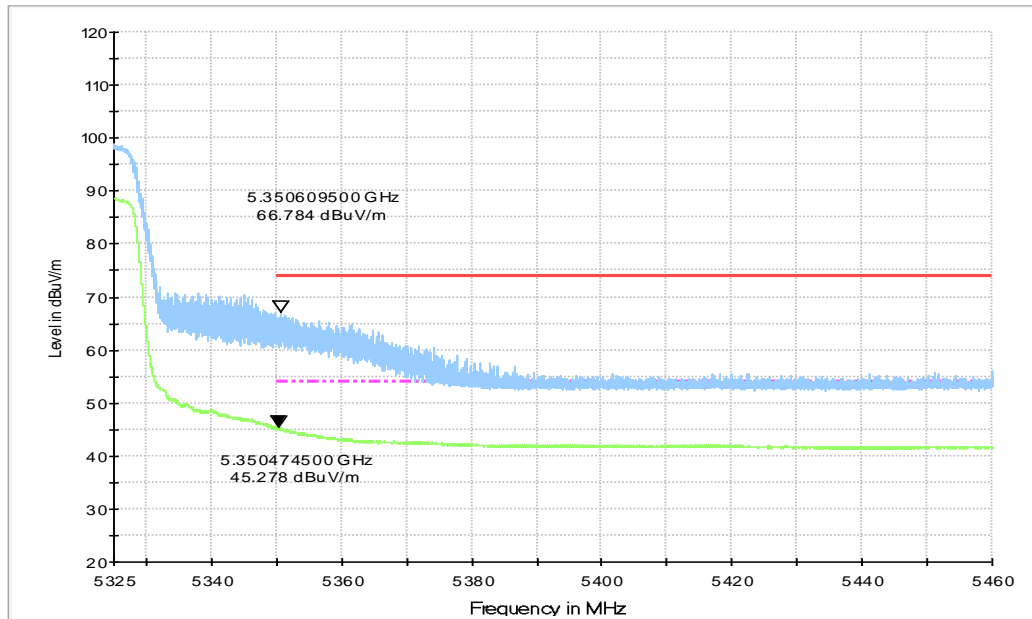


Fig.51 Band Edges (802.11ac-HT40 Ch62, 5310MHz)

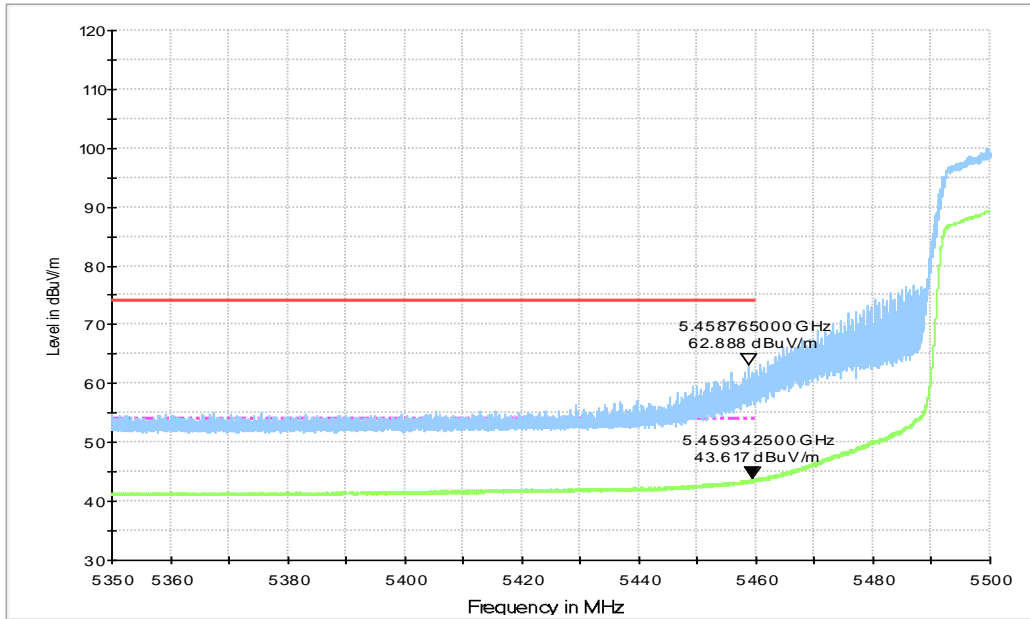


Fig.52 Band Edges (802.11ac-HT40 Ch102, 5510MHz)

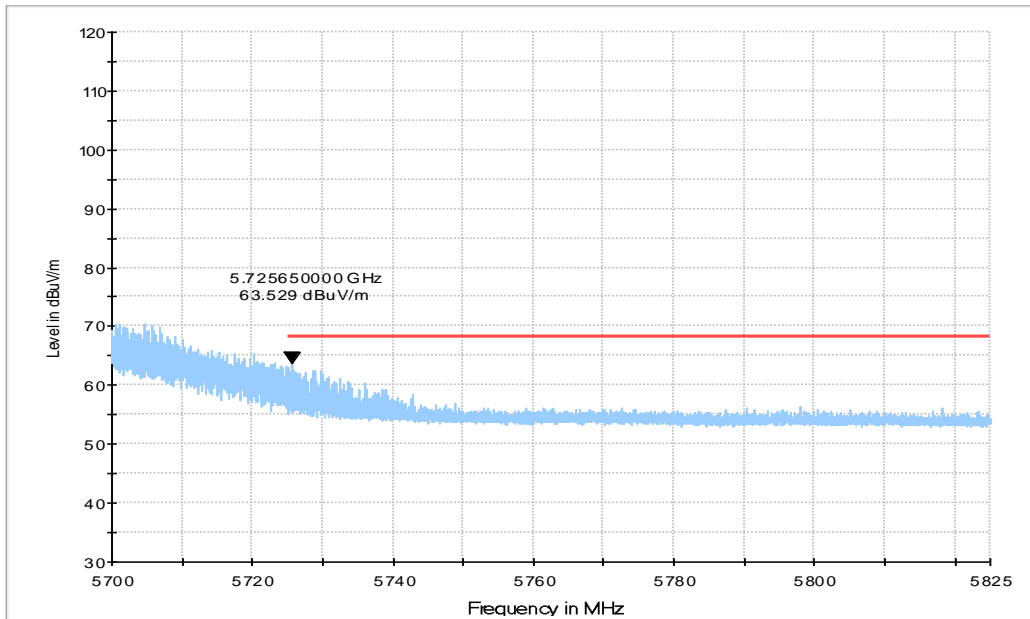


Fig.53 Band Edges (802.11ac-HT40 Ch134, 5670MHz)

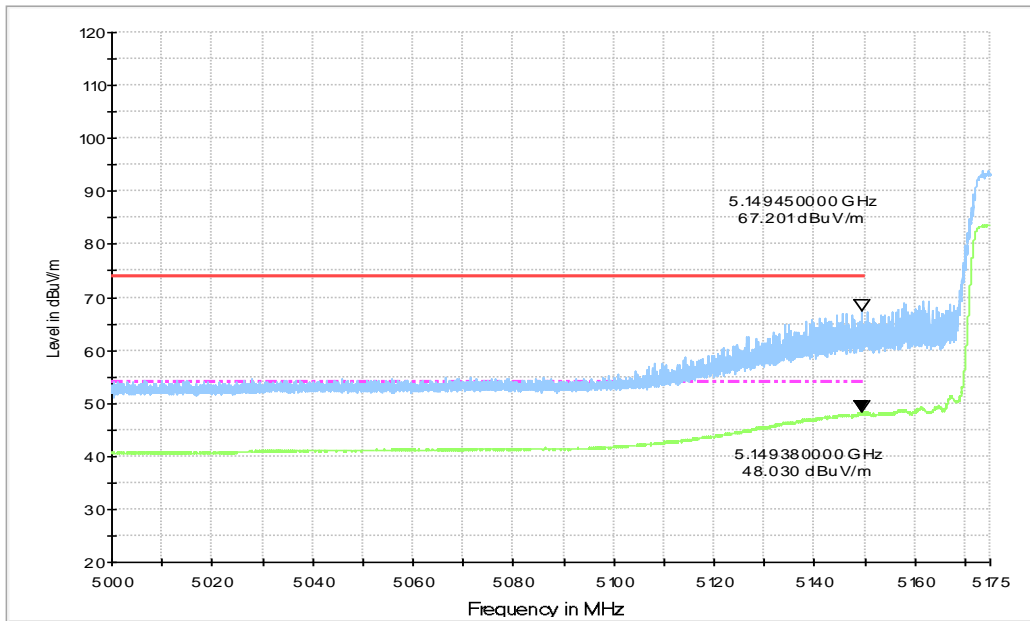


Fig.54 Band Edges (802.11ac-HT80 Ch42 , 5210MHz)

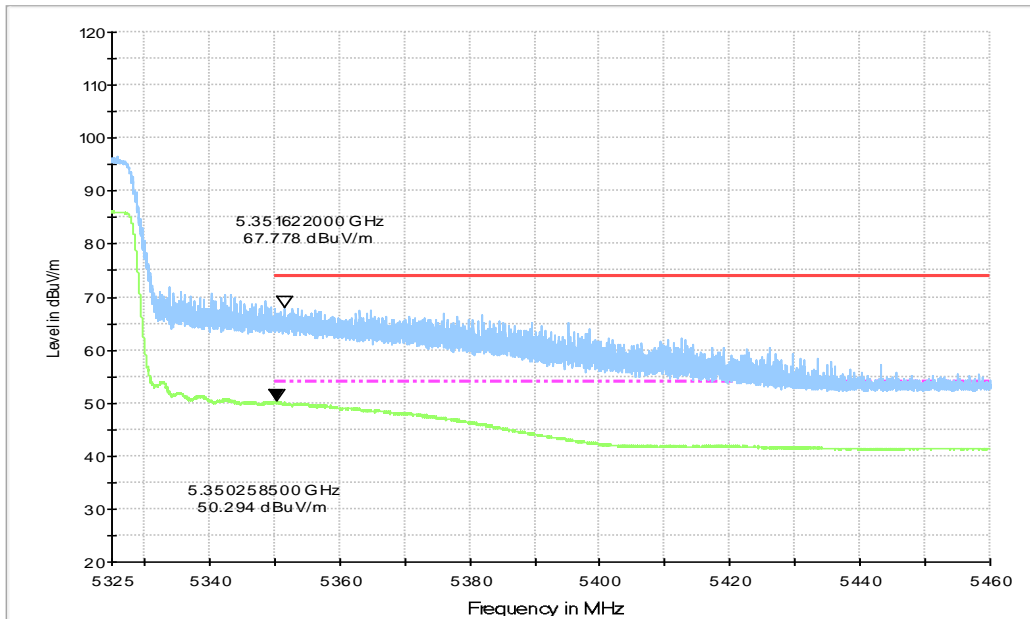


Fig.55 Band Edges (802.11ac-HT80 Ch58, 5290MHz)

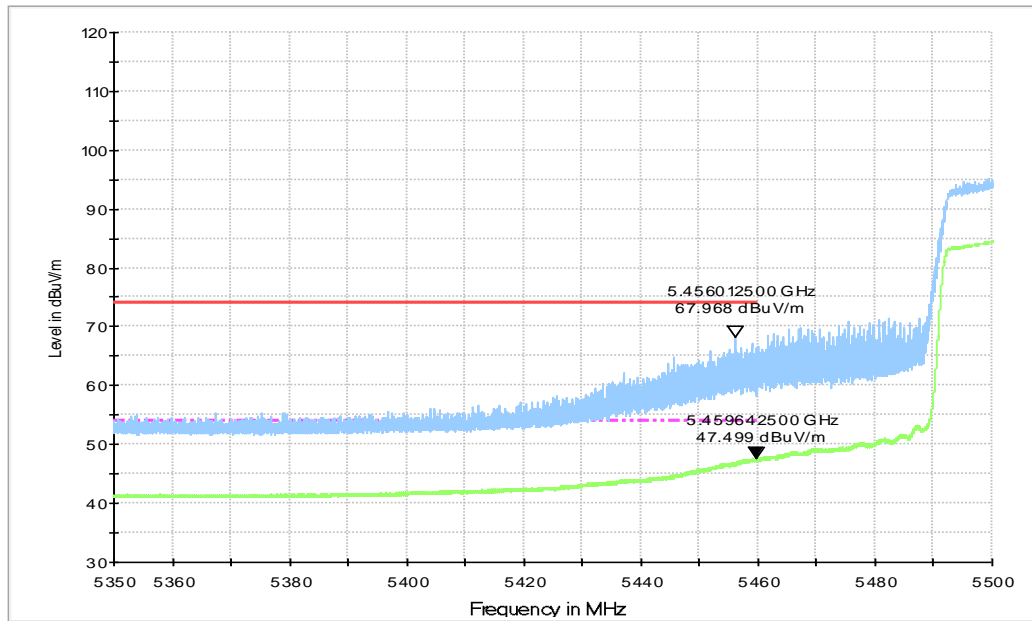


Fig.56 Band Edges (802.11ac-HT80 Ch106, 5530MHz)

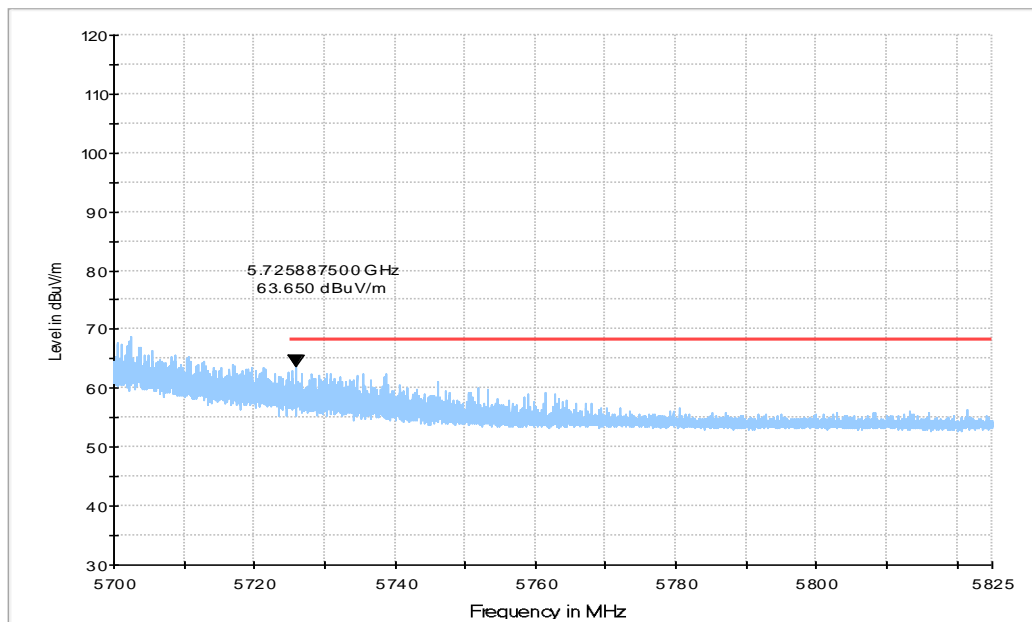


Fig.57 Band Edges (802.11ac-HT80 Ch122, 5610MHz)

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(μ V/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(μ V/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

Sample Calculations

1. Convert the resultant EIRP level to an equivalent electric field strength using the following relationship:

$$E = \text{EIRP} - 20 \log(D) + 104.77$$

Where:

E is the field strength in dB μ V/m

D is the measurement distance in meters

EIRP is the equivalent isotropically radiated power in dbm

2. The measurement results are obtained as described below:

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

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.

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
	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

		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
		26.5 GHz ~ 40 GHz	---	P
	140(5700MHz)	1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P



		7 GHz ~ 18 GHz	---	P
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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
	62(5310MHz)	26.5 GHz ~ 40 GHz	---	P
		1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
	102(5510MHz)	7 GHz ~ 18 GHz	---	P
		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
	118(5590MHz)	26.5 GHz ~ 40 GHz	---	P
		1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
	134(5670MHz)	7 GHz ~ 18 GHz	---	P
		1 GHz ~ 3 GHz	---	P
3 GHz ~ 7 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	
	64(5320MHz)	26.5 GHz ~ 40 GHz	---	P	
		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	
		3 GHz ~ 7 GHz	---	P	
		7 GHz ~ 18 GHz	---	P	



802.11ac-HT40 mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11ac HT40	38(5190MHz)	30 MHz ~1 GHz	---	P
		1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
		7 GHz ~ 18 GHz	---	P
		18 GHz ~ 26.5 GHz	---	P
		26.5 GHz ~ 40 GHz	---	P
	46(5230MHz)	1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
		7 GHz ~ 18 GHz	---	P
	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
	62(5310MHz)	26.5 GHz ~ 40 GHz	---	P
		1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
	102(5510MHz)	7 GHz ~ 18 GHz	---	P
		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
	118(5590MHz)	26.5 GHz ~ 40 GHz	---	P
		1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
	134(5670MHz)	7 GHz ~ 18 GHz	---	P
		1 GHz ~ 3 GHz	---	P
3 GHz ~ 7 GHz		---	P	

802.11ac-HT80 mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11ac -HT80	42(5210MHz)	1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
		7 GHz ~ 18 GHz	---	P
	58(5290MHz)	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
	106(5530MHz)	1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
		7 GHz ~ 18 GHz	---	P
	122(5610MHz)	1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
7 GHz ~ 18 GHz		---	P	

Conclusion: PASS

AVERAGE Results:
802.11a

Channel 36

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
5148.200	41.41	-25.69	34.25	32.85	54.00	12.59	V
5149.800	41.45	-25.70	34.25	32.89	54.00	12.55	V
11954.400	34.52	-31.65	38.75	27.43	54.00	19.48	H
15540.400	36.41	-28.84	40.06	25.19	54.00	17.59	V
17857.000	38.29	-26.33	41.19	23.43	54.00	15.71	H
17953.800	38.37	-26.11	41.26	23.21	54.00	15.63	H

Channel 40

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
5147.200	40.59	-25.69	34.25	32.03	54.00	13.41	V
5352.000	40.22	-25.76	34.46	31.52	54.00	13.78	V
11953.300	34.57	-31.65	38.75	27.48	54.00	19.43	V
15599.800	35.81	-28.71	40.14	24.38	54.00	18.19	V
17851.500	38.17	-26.34	41.18	23.33	54.00	15.83	H
17954.900	38.38	-26.10	41.26	23.22	54.00	15.62	V

Channel 48

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
5143.800	40.33	-25.68	34.25	31.76	54.00	13.67	V
5351.600	40.48	-25.76	34.46	31.79	54.00	13.52	V
11957.700	34.53	-31.64	38.75	27.42	54.00	19.47	H
15719.700	36.05	-28.48	40.31	24.23	54.00	17.95	H
17857.000	38.25	-26.33	41.19	23.39	54.00	15.75	H
17952.700	38.34	-26.11	41.26	23.18	54.00	15.66	H

Channel 52

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
5142.600	40.22	-25.68	34.25	31.65	54.00	13.78	V
5356.600	40.43	-25.76	34.46	31.72	54.00	13.57	V
12440.600	34.45	-31.14	38.89	26.71	54.00	19.55	H
15780.200	35.83	-28.38	40.40	23.81	54.00	18.17	H
17853.700	38.19	-26.34	41.18	23.35	54.00	15.81	H
17953.800	38.26	-26.11	41.26	23.10	54.00	15.74	H

Channel 56

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
5147.400	40.15	-25.69	34.25	31.59	54.00	13.85	V
5353.000	40.70	-25.76	34.46	32.00	54.00	13.30	V
12447.200	34.34	-31.12	38.89	26.58	54.00	19.66	V
15839.600	36.66	-28.18	40.48	24.37	54.00	17.34	V
17855.900	38.14	-26.33	41.19	23.29	54.00	15.86	V
17956.000	38.31	-26.10	41.27	23.14	54.00	15.69	V

Channel 64

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
5350.400	42.05	-25.76	34.46	33.36	54.00	11.95	V
5350.800	41.92	-25.76	34.46	33.22	54.00	12.08	V
10639.900	35.20	-33.30	37.59	30.92	54.00	18.80	H
15959.500	36.78	-27.65	40.64	23.79	54.00	17.22	H
17860.300	38.21	-26.32	41.19	23.35	54.00	15.79	V
17956.000	38.31	-26.10	41.27	23.15	54.00	15.69	V

Channel 100

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
5452.400	42.44	-25.37	34.55	33.25	54.00	11.56	V
5459.400	43.38	-25.33	34.56	34.15	54.00	10.62	V
10999.050	36.66	-32.68	37.80	31.54	54.00	17.34	H
17867.450	38.32	-26.31	41.20	23.43	54.00	15.68	V
17959.350	38.40	-26.09	41.27	23.22	54.00	15.60	H
17852.060	38.32	-26.34	41.18	23.48	54.00	15.68	H

Channel 120

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
5441.800	40.41	-25.44	34.54	31.30	54.00	13.59	V
5457.200	40.55	-25.34	34.56	31.34	54.00	13.45	V
11200.000	36.15	-32.08	37.96	30.26	54.00	17.85	H
17854.800	38.25	-26.34	41.18	23.40	54.00	15.75	H
17955.450	38.34	-26.10	41.26	23.18	54.00	15.66	V
17883.460	38.46	-26.27	41.21	23.52	54.00	15.54	V

Channel 140

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
5438.800	40.27	-25.46	34.54	31.19	54.00	13.73	V
5456.000	40.41	-25.35	34.56	31.20	54.00	13.59	V
11400.000	35.13	-32.34	38.12	29.35	54.00	18.87	H
17879.000	38.39	-26.28	41.20	23.46	54.00	15.61	H
17968.150	38.36	-26.07	41.27	23.16	54.00	15.64	V
17949.480	38.37	-26.12	41.26	23.23	54.00	15.63	V

Channel 144

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
5453.200	40.11	-25.37	34.56	30.92	54.00	13.89	V
5458.400	40.05	-25.34	34.56	30.83	54.00	13.95	V
11440.000	33.34	-32.43	38.15	27.62	54.00	20.66	H
15939.200	37.00	-27.74	40.62	24.12	54.00	17.00	H
17848.800	38.18	-26.35	41.18	23.34	54.00	15.82	H
17956.000	38.21	-26.10	41.27	23.05	54.00	15.79	H

802.11n-HT20
Channel 36

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
5148.200	41.06	-25.69	34.25	32.50	54.00	12.94	V
5149.400	41.29	-25.70	34.25	32.74	54.00	12.71	V
11954.400	34.53	-31.65	38.75	27.43	54.00	19.47	V
15540.400	36.05	-28.84	40.06	24.83	54.00	17.95	H
17849.300	38.14	-26.35	41.18	23.31	54.00	15.86	V
17953.800	38.31	-26.11	41.26	23.15	54.00	15.69	V

Channel 40

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
5143.800	40.72	-25.68	34.25	32.15	54.00	13.28	V
5350.600	40.10	-25.76	34.46	31.41	54.00	13.90	V
11955.500	34.50	-31.65	38.75	27.40	54.00	19.50	V
15599.800	35.75	-28.71	40.14	24.32	54.00	18.25	V
17857.000	38.22	-26.33	41.19	23.36	54.00	15.78	H
17956.000	38.31	-26.10	41.27	23.14	54.00	15.69	V