FCC PART 15
TEST REPORT
No. I17Z40029-SRD02

for

TCL Communication Ltd.

GSM Quad-band/CDMA/EVDO Tri-band/ HSPA-UMTS Six-band/LTE

15 band mobile phone

With

BBB100-3

FCC ID: 2ACCJN017

Hardware Version:05

Software Version: AAJ048

Issued Date: 2017-03-16

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.

Test Laboratory:

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REPORT HISTORY

Report Number	Revision	Description	Issue Date
I17Z40029-SRD02	Rev.0	1st edition	2017-03-16

CONTENTS

1. TEST LATORATORY

1.1. Testing Location

Location 1:CTTL(huayuan North Road)

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

1.2. Testing Environment

Normal Temperature:	15-35℃
Extreme Temperature:	-10/+55℃
Relative Humidity:	20-75%

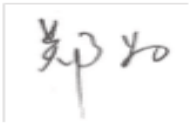
1.3. Project data

Testing Start Date:	2016-12-28
Testing End Date:	2017-02-23

1.4. Signature

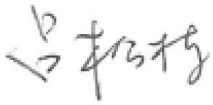
Jiang Xue

(Prepared this test report)



Zheng Wei

(Reviewed this test report)



Lv Songdong

(Approved this test report)

2. CLIENT INFORMATION

2.1. Applicant Information

Company Name:	TCL Communication Ltd
Address:	5F, C building, No. 232, Liang Jing Road ZhangJiang High-Tech Park, Pudong Area Shanghai, P.R. China. 201203
City:	Shanghai
Postal Code:	/
Country:	China
Telephone:	0086-21-31363544
Fax:	0086-21-61460602

2.2. Manufacturer Information

Company Name:	TCL Communication Ltd
Address:	5F, C building, No. 232, Liang Jing Road ZhangJiang High-Tech Park, Pudong Area Shanghai, P.R. China. 201203
City:	Shanghai
Postal Code:	/
Country:	China
Telephone:	0086-21-31363544
Fax:	0086-21-61460602

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

3.1. About EUT

Description	GSM Quad-band/CDMA/EVDO Tri-band/ HSPA-UMTS Six-band/LTE 15 band mobile phone
Model name	BBB100-3
FCC ID	2ACCJN017
IC ID	/
WLAN Frequency Range	ISM Bands: -5150MHz~5350MHz -5470MHz~5725MHz -5725MHz~5850MHz
Type of modulation	OFDM
Antenna Type	Integral Antenna
Antenna Gain	0.44dBi
Voltage	3.8V DC by Battery

Note: Photographs of EUT are shown in ANNEX C of this test report. Components list, please refer to documents of the manufacturer.

3.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version
EUT1	/	05	AAJ048
EUT2	/	05	AAJ048

*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	Type	SN
AE1	battery	/	/
AE2	battery	/	/
AE3	Travel charger	/	16TCT-CH-1886
AE4	Travel charger	/	16TCT-CH-1872
AE5	Travel charger	/	16TCT-CH-0005
AE6	USB Cable	/	/
AE7	USB Cable	/	/
AE10	Travel charger	/	/

AE11	Travel charger	/	/

AE1

Model	BAT-63108-003
SN	CAC3440001C3
Manufacturer	ATL
Capacitance	3440 mAh
Nominal voltage	3.85V

AE2

Model	TLp034E1
SN	CAC3440003C1
Manufacturer	BYD
Capacitance	3440 mAh
Nominal voltage	3.85V

AE3

Name	CBA0060AGHC1
Model	QC10US
Manufacturer	BYD
Length of cable	/

AE4

Name	CBA0060ACHC1
Model	QC10AU
Manufacturer	BYD
Length of cable	/

AE5

Name	CBA0060AJHC1
Model	QC10IN
Manufacturer	BYD
Length of cable	/

AE6

Model	CDA0000105CF
Manufacturer	LUXSHARE
Length of cable	99cm

AE7

Model	CDA0000108C2
Manufacturer	SHENGHUA
Length of cable	99cm

AE10

Name	CBA0060AAHC1
Model	QC10EU
Manufacturer	BYD
Length of cable	/

AE11

Name	CBA0060ABHC1

Model	QC10UK
Manufacturer	BYD
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 GSM Quad-band/CDMA/EVDO Tri-band/ HSPA-UMTS Six-band/LTE 15 band mobile phone with integrated antenna and inbuilt battery.
It has Bluetooth (EDR) function.
It consists of normal options: travel charger, USB cable and Phone.
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	2015
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	Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - Part 15, Subpart E	2014-06

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**
Power Spectral Density	15.407	/	**P**
Occupied 26dB Bandwidth	15.403	/	**P**
Band edge compliance	15.407	/	**P**
Transmitter spurious emissions radiated	15.407	/	**P**
Spurious emissions radiated < 30 MHz	15.407	/	**P**
Spurious emissions conducted < 30 MHz	15.407	/	**P**
Frequency Stability	15.407	/	**NA**
Transmit Power Control	15.407	/	**NA**

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

Terms used in Verdict column

P	Pass, The EUT complies with the essential requirements in the standard.
NM	Not measured, The test was not measured by CTTL
NA	Not Applicable, The test was not applicable
F	Fail, The EUT does not comply with the essential requirements in the standard

6.2. Statements

CTTL has evaluated the test cases requested by the client/manufacturer as listed in section 6.1 of this report for the EUT specified in section 3 according to the standards or reference documents listed in section 4.1.

This report only deals with the WLAN function among the features described in section 3.

This model is a variant product which model name is BBB100-1; all the test results have been derived from test report of BBB100-1.

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	T nom	26℃
Voltage	V nom	3.8V (By battery)
Humidity	H nom	44%

7. TEST EQUIPMENTS UTILIZED

Conducted test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration date	Calibration Due date
1	Vector Signal Analyzer	FSQ40	200089	Rohde & Schwarz	2016-06-07	2017-06-06
2	Test Receiver	ESCI	100948	Rohde & Schwarz	1 year	2017-07-05
3	LISN	ENV216	101200	Rohde & Schwarz	1 year	2017-07-10
4	Shielding Room	S81	/	ETS-Lindgren	/	/

Radiated emission test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration date	Calibration Due date
1	Test Receiver	ESU26	100235	Rohde & Schwarz	2016-03-03	2017-03-02
2	Loop antenna	HFH2-Z2	829324/007	Rohde & Schwarz	2014-12-17	2017-12-16
3	BiLog Antenna	VULB9163	301	Schwarzbeck	2014-12-17	2017-12-16
4	Dual-Ridge Waveguide Horn Antenna	3115	6914	EMCO	2014-12-16	2017-12-15
5	Dual-Ridge Waveguide Horn Antenna	3116	2661	ETS-Lindgren	2014-06-18	2017-06-17
6	Vector Signal Analyzer	FSV40	101047	Rohde & Schwarz	2016-06-29	2017-06-28
7	Semi-anechoic chamber	/	CT000332-1074	Frankonia German	/	/

Test Item	Test Software and Version	Software Vendor
Radiated Continuous Emission	EMC32 V8.40.0	R&S
Conducted Continuous Emission	EMC32 V8.52.0	R&S

8. Measurement Uncertainty

8.1. Transmitter Output Power

Measurement Uncertainty: 0.339dB,k=1.96

8.2. Peak Power Spectral Density

Measurement Uncertainty: 0.705dBm/MHz,k=1.96

8.3. Occupied Channel Bandwidth

Measurement Uncertainty: 60.80Hz,k=1.96

8.4. Band Edges Compliance

Measurement Uncertainty : 0.62dBm,k=1.96

8.5. Spurious Emissions

Conducted (k=1.96)

Frequency Range	Uncertainty(dBm)
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)

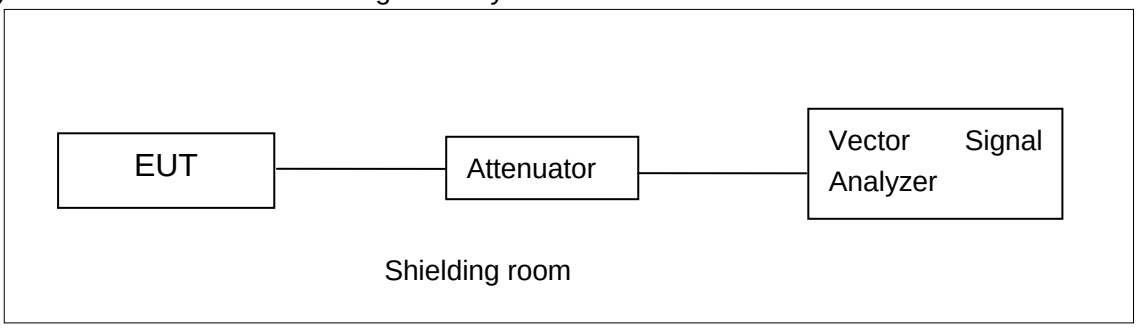
Frequency Range	Uncertainty(dBm)
9kHz-30MHz	3.94
30MHz ≤ f ≤ 1GHz	4.86
1GHz ≤ f ≤18GHz	5.26
18GHz ≤ f ≤40GHz	5.28

ANNEX A: MEASUREMENT RESULTS

A.1. Measurement Method

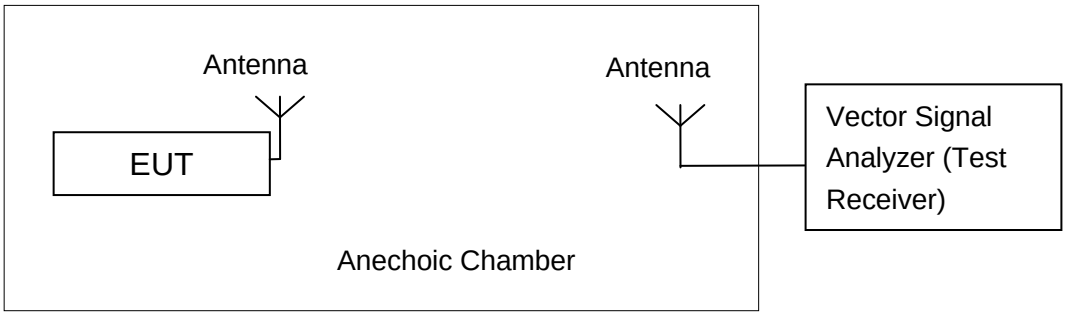
A.1.1. Conducted Measurements

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.

Method of Measurement: See ANSI C63.10-2013-clause 12.3.2.2.

a) Set span to encompass the entire 26 dB EBW or 99% OBW of the signal.

b) Set RBW = 1 MHz.

c) Set VBW ≥3 MHz.

d) Number of points in sweep ≥[2 ×span / RBW]. (This gives bin-to-bin spacing ≤RBW / 2, so that narrowband signals are not lost between frequency bins.)

e) Sweep time = auto.

f) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.

g) If transmit duty cycle < 98%, use a video trigger withthe trigger level set to enable triggering only on full power pulses. The transmitter shall operate at maximum power control level for the entire duration of every sweep. If the EUT transmits continuously (i.e., with no OFFintervals) or at duty cycle ≥98%, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to “free run.”

h) Trace average at least 100 traces in power averaging (rms) mode.

i) Compute power by integrating the spectrum across the 26 dB EBW or 99% OBW of the signal using the instrument’s band power measurement function, with band limits set equal to the EBW or OBW band edges. If the instrument does not have a band power function, then sum the spectrum levels (in power units) at 1 MHz intervals extending across the 26 dB EBW or 99% OBW of the spectrum.

Measurement Results:

802.11a mode

Mode	Channel	Test Result (dBm)							
		Data Rate (Mbps)							
		6	9	12	18	24	36	48	54
802.11a	5180MHz (Ch36)	18.55	18.39	18.10	18.04	18.01	18.00	17.49	17.48
	5200MHz (Ch40)	18.34	/	/	/	/	/	/	/
	5240MHz(Ch48)	18.68	/	/	/	/	/	/	/
	5260MHz(Ch52)	18.64	/	/	/	/	/	/	/
	5280MHz(Ch56)	18.55	/	/	/	/	/	/	/
	5320MHz(Ch64)	18.96	/	/	/	/	/	/	/
	5500MHz(Ch100)	18.36	/	/	/	/	/	/	/
	5580MHz(Ch116)	18.40	/	/	/	/	/	/	/
	5700MHz(Ch140)	17.03	/	/	/	/	/	/	/

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

802.11n-HT20 mode

Mode	Channel	Test Result (dBm)							
		Data Rate							
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
802.11n (HT20)	5180MHz (Ch36)	18.56	18.54	18.52	17.60	17.55	17.52	16.53	16.44
	5200MHz (Ch40)	18.47	/	/	/	/	/	/	/
	5240MHz(Ch48)	18.67	/	/	/	/	/	/	/
	5260MHz(Ch52)	18.66	/	/	/	/	/	/	/
	5280MHz(Ch56)	18.65	/	/	/	/	/	/	/
	5320MHz(Ch64)	18.94	/	/	/	/	/	/	/
	5500MHz(Ch100)	18.44	/	/	/	/	/	/	/
	5580MHz(Ch116)	18.45	/	/	/	/	/	/	/
	5700MHz(Ch140)	17.08	/	/	/	/	/	/	/

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

802.11ac-HT20 mode

Mode	Channel	Test Result (dBm)							
		Data Rate							
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
802.11ac (HT20)	5180MHz (Ch36)	18.52	18.46	18.47	17.54	17.53	17.49	16.34	16.31
	5200MHz (Ch40)	18.40	/	/	/	/	/	/	/
	5240MHz(Ch48)	18.58	/	/	/	/	/	/	/
	5260MHz(Ch52)	18.64	/	/	/	/	/	/	/
	5280MHz(Ch56)	18.62	/	/	/	/	/	/	/
	5320MHz(Ch64)	18.95	/	/	/	/	/	/	/
	5500MHz(Ch100)	18.41	/	/	/	/	/	/	/
	5580MHz(Ch116)	18.51	/	/	/	/	/	/	/
	5700MHz(Ch140)	17.10	/	/	/	/	/	/	/

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

802.11n-HT40 mode

Mode	Channel	Test Result (dBm)							
		Data Rate							
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
802.11n (HT40)	5190MHz (Ch38)	19.16	19.04	19.02	18.19	18.06	18.04	17.01	16.97
	5230MHz(Ch46)	19.15	/	/	/	/	/	/	/
	5270MHz(Ch54)	19.39	/	/	/	/	/	/	/
	5310MHz(Ch62)	19.71	/	/	/	/	/	/	/
	5510MHz(Ch102)	19.30	/	/	/	/	/	/	/
	5550MHz(Ch110)	19.35	/	/	/	/	/	/	/
	5670MHz(Ch134)	18.12	/	/	/	/	/	/	/

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

802.11ac-HT40 mode

Mode	Channel	Test Result (dBm)								
		Data Rate								
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	MCS8
802.11ac (HT40)	5190MHz (Ch38)	19.07	19.01	18.99	18.89	18.11	18.05	17.12	16.99	14.81
	5230MHz(Ch46)	19.25	/	/	/	/	/	/	/	
	5270MHz(Ch54)	19.37	/	/	/	/	/	/	/	
	5310MHz(Ch62)	19.64	/	/	/	/	/	/	/	
	5510MHz(Ch102)	19.35	/	/	/	/	/	/	/	
	5550MHz(Ch110)	19.38	/	/	/	/	/	/	/	
	5670MHz(Ch134)	18.10	/	/	/	/	/	/	/	

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

802.11ac-HT80 mode

Mode	Channel	Test Result (dBm)								
		Data Rate								
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	MCS8
802.11ac (HT80)	5210MHz(Ch42)	18.52	18.47	18.36	17.45	17.30	17.26	16.31	16.29	16.21
	5290MHz(Ch58)	18.79	/	/	/	/	/	/	/	/
	5530MHz(Ch106)	18.60	/	/	/	/	/	/	/	/
	5610MHz(Ch122)	18.34	/	/	/	/	/	/	/	/

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

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

Method of Measurement: See ANSI C63.10-2013-clause 12.5.

a) Create an average power spectrumfor the EUT operating mode being tested by following the instructions in 12.3.2 for measuring maximum conducted output power using a spectrum analyzer or EMI receiver; that is, select the appropriate test method (SA-1, SA-2, SA-3, or their respective alternatives) and apply it up to, but not including, the step labeled, “Compute power….” (This procedure is required evenif the maximum conducted output power measurement was performed using the power meter method PM.)

b) Use the peak search function on the instrument to find the peak of the spectrum.

c) Make the following adjustments to the peak value of the spectrum.

d) The result is the PPSD.

e) The procedure in item a)through item c) requires the use of 1 MHz resolution bandwidth to satisfy the 1 MHz measurement bandwidth specified by some regulatory authorities.This requirement also permits use of resolution bandwidths less than 1 MHz “provided that the measured power is integrated toshow the total power over the measurement bandwidth” (i.e., 1 MHz).

Measurement Results:

Mode	Channel	Power Spectral Density (dBm/MHz)	Conclusion
802.11a	5180 MHz	1.70	P
	5200 MHz	1.90	P
	5240 MHz	3.91	P
	5260 MHz	4.28	P
	5280 MHz	5.27	P
	5320 MHz	6.16	P
	5500 MHz	4.89	P
	5580 MHz	4.41	P
	5700 MHz	5.46	P
802.11n HT20	5180 MHz	1.45	P
	5200 MHz	1.43	P
	5240 MHz	3.59	P
	5260 MHz	4.00	P
	5280 MHz	4.99	P
	5320 MHz	5.96	P
	5500 MHz	4.65	P
	5580 MHz	4.34	P
	5700 MHz	5.03	P

802.11ac HT20	5180 MHz	1.36	P
	5200 MHz	1.58	P
	5240 MHz	3.69	P
	5260 MHz	4.00	P
	5280 MHz	5.14	P
	5320 MHz	5.91	P
	5500 MHz	4.66	P
	5580 MHz	4.36	P
	5700 MHz	4.76	P
802.11n HT40	5190 MHz	-1.26	P
	5230 MHz	0.37	P
	5270 MHz	1.83	P
	5310 MHz	2.78	P
	5510 MHz	1.35	P
	5550 MHz	0.92	P
	5670 MHz	1.34	P
802.11ac HT40	5190 MHz	-1.43	P
	5230 MHz	0.36	P
	5270 MHz	1.79	P
	5310 MHz	2.79	P
	5510 MHz	1.31	P
	5550 MHz	0.82	P
	5670 MHz	1.56	P
802.11ac HT80	5210MHz	-3.02	P
	5290MHz	0.09	P
	5530MHz	-0.39	P
	5610MHz	-0.81	P

Conclusion: PASS

A.4. 26dBc Bandwidth (conducted)

Measurement Limit:

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

Method of Measurement: See ANSI C63.10-2013-clause 12.4.1.

Measurement Uncertainty:

Measurement Uncertainty	60.80Hz

Measurement Result:

Mode	Channel	Occupied 26dB Bandwidth (MHz)		conclusion
802.11a	5180 MHz	Fig.1	32.90	P
	5200 MHz	Fig.2	33.75	P
	5240 MHz	Fig.3	32.80	P
	5260 MHz	Fig.4	37.75	P
	5280 MHz	Fig.5	39.95	P
	5320 MHz	Fig.6	37.05	P
	5500 MHz	Fig.7	41.04	P
	5580 MHz	Fig.8	32.30	P
	5700 MHz	Fig.9	23.85	P
802.11n HT20	5180 MHz	Fig.10	31.00	P
	5200 MHz	Fig.11	35.75	P
	5240 MHz	Fig.12	37.15	P
	5260 MHz	Fig.13	42.00	P
	5280 MHz	Fig.14	40.30	P
	5320 MHz	Fig.15	39.10	P
	5500 MHz	Fig.16	43.75	P
	5580 MHz	Fig.17	30.05	P
	5700 MHz	Fig.18	25.25	P
802.11ac HT20	5180 MHz	Fig.19	30.30	P
	5200 MHz	Fig.20	31.10	P
	5240 MHz	Fig.21	30.95	P
	5260 MHz	Fig.22	33.40	P
	5280 MHz	Fig.23	33.55	P
	5320 MHz	Fig.24	32.95	P
	5500 MHz	Fig.25	42.35	P
	5580 MHz	Fig.26	30.55	P
	5700 MHz	Fig.27	24.00	P
802.11n HT40	5190 MHz	Fig.28	62.96	P
	5230 MHz	Fig.29	51.76	P
	5270 MHz	Fig.30	70.32	P
	5310 MHz	Fig.31	60.16	P

	5510 MHz	Fig.32	77.44	P
	5550 MHz	Fig.33	69.60	P
	5670 MHz	Fig.34	45.92	P
802.11ac HT40	5190 MHz	Fig.35	45.92	P
	5230 MHz	Fig.36	49.44	P
	5270 MHz	Fig.37	60.72	P
	5310 MHz	Fig.38	49.84	P
	5510 MHz	Fig.39	69.92	P
	5550 MHz	Fig.40	57.52	P
	5670 MHz	Fig.41	45.68	P
802.11ac HT80	5210MHz	Fig.42	93.28	P
	5290MHz	Fig.43	89.60	P
	5530MHz	Fig.44	112.16	P
	5610MHz	Fig.45	86.24	P

Conclusion: PASS

Test graphs as below:

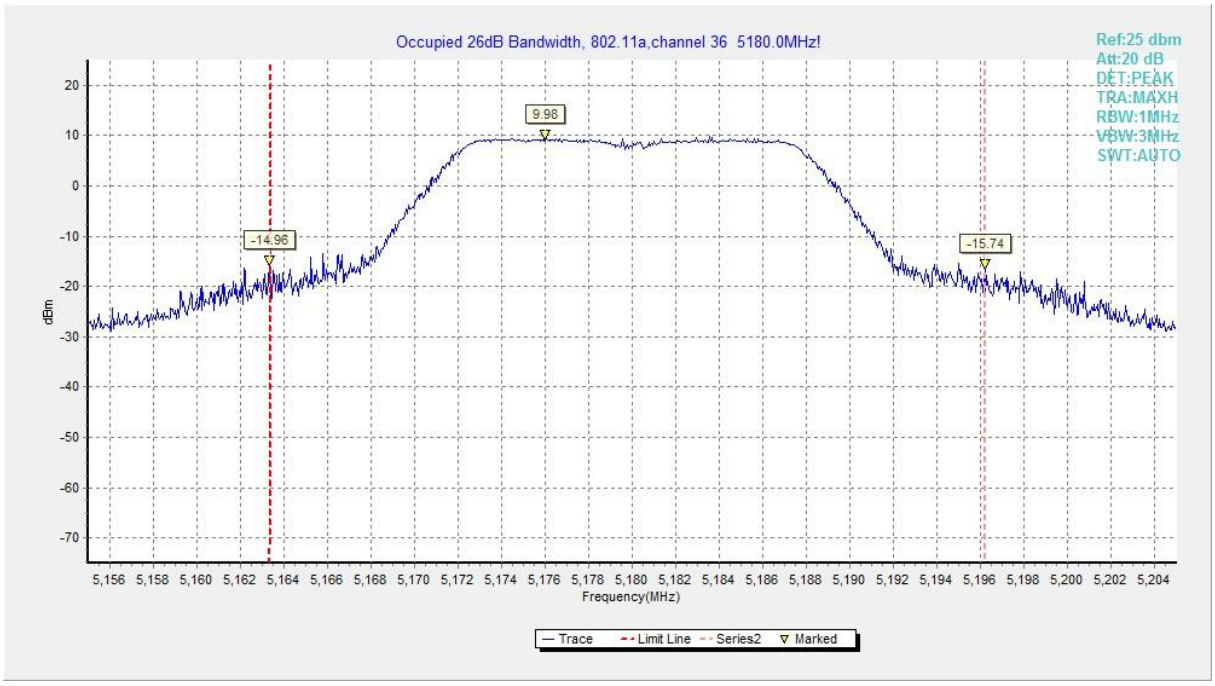


Fig. 1 Occupied 26dB Bandwidth (802.11a, 5180MHz)

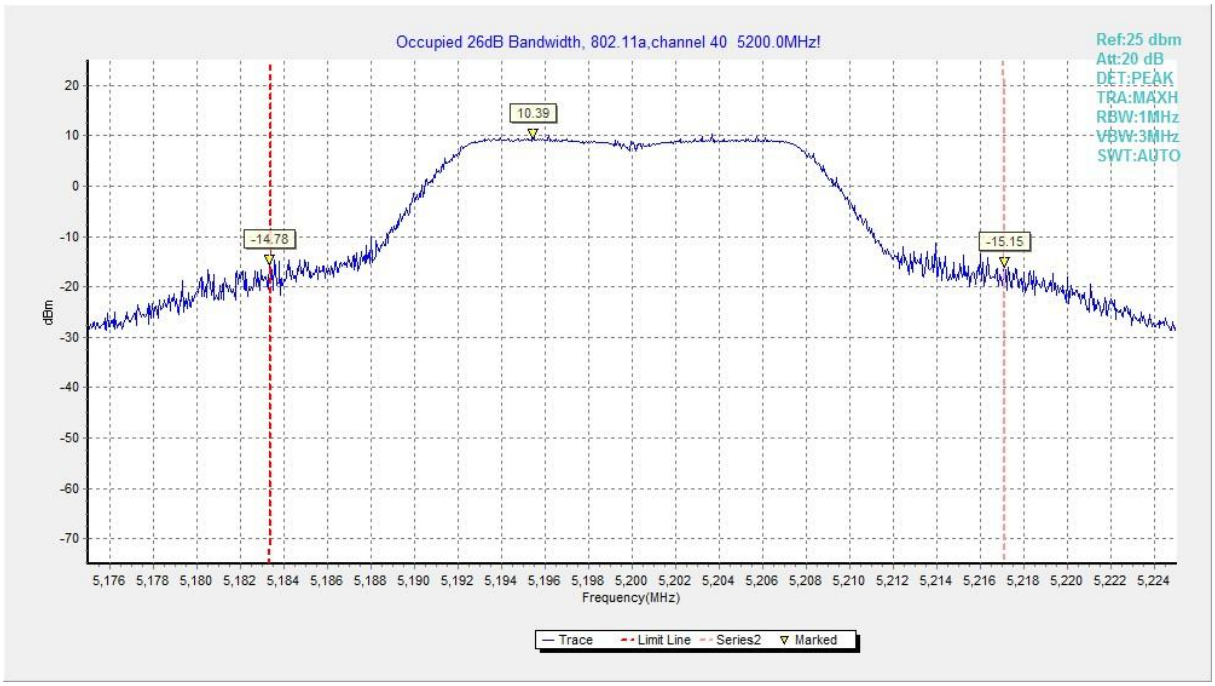


Fig. 2 Occupied 26dB Bandwidth (802.11a, 5200MHz)

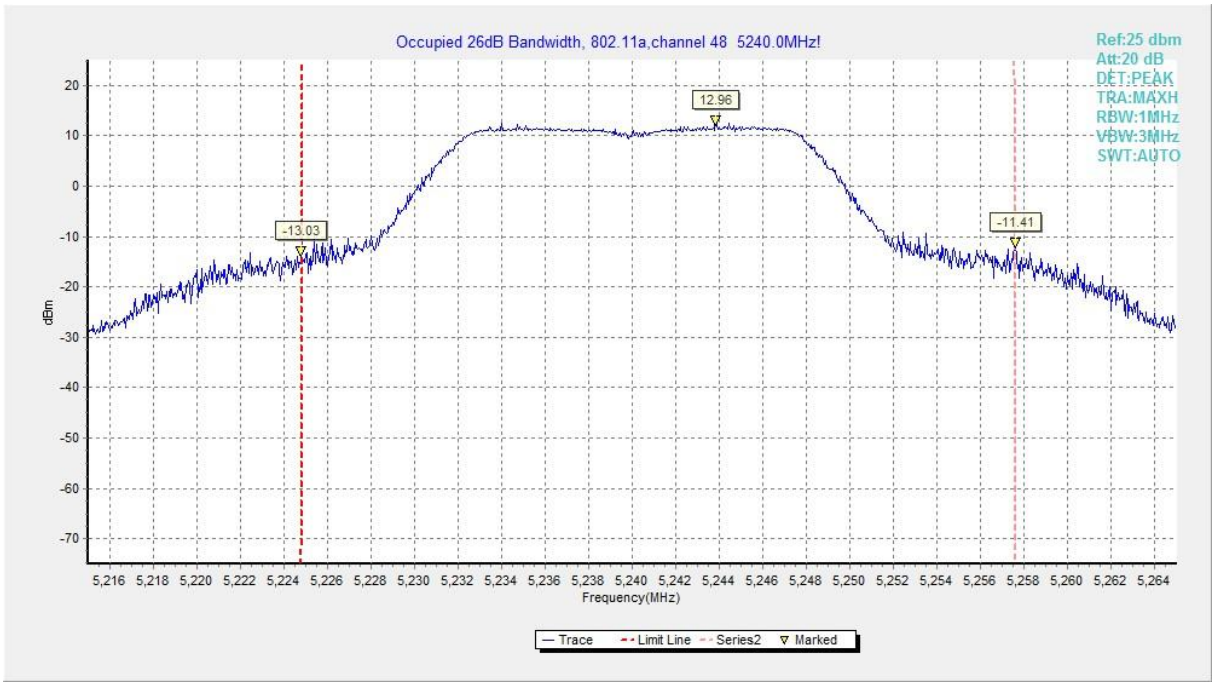


Fig. 3 Occupied 26dB Bandwidth (802.11a, 5240MHz)

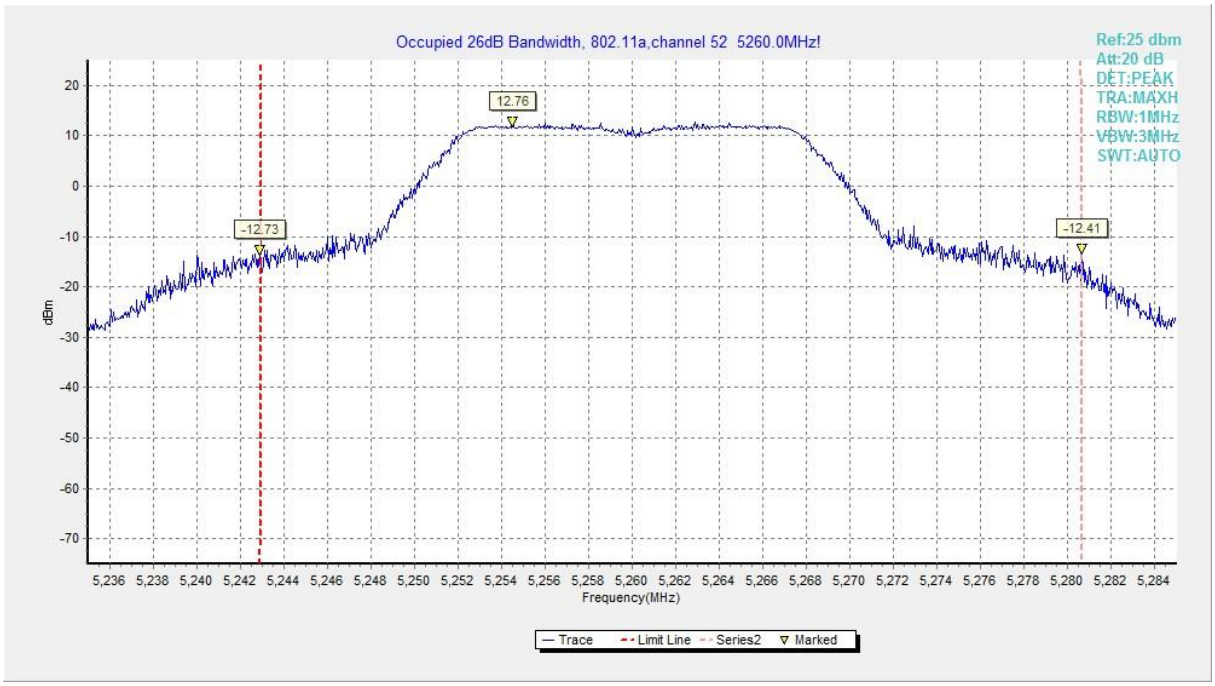


Fig. 4 Occupied 26dB Bandwidth (802.11a, 5260MHz)

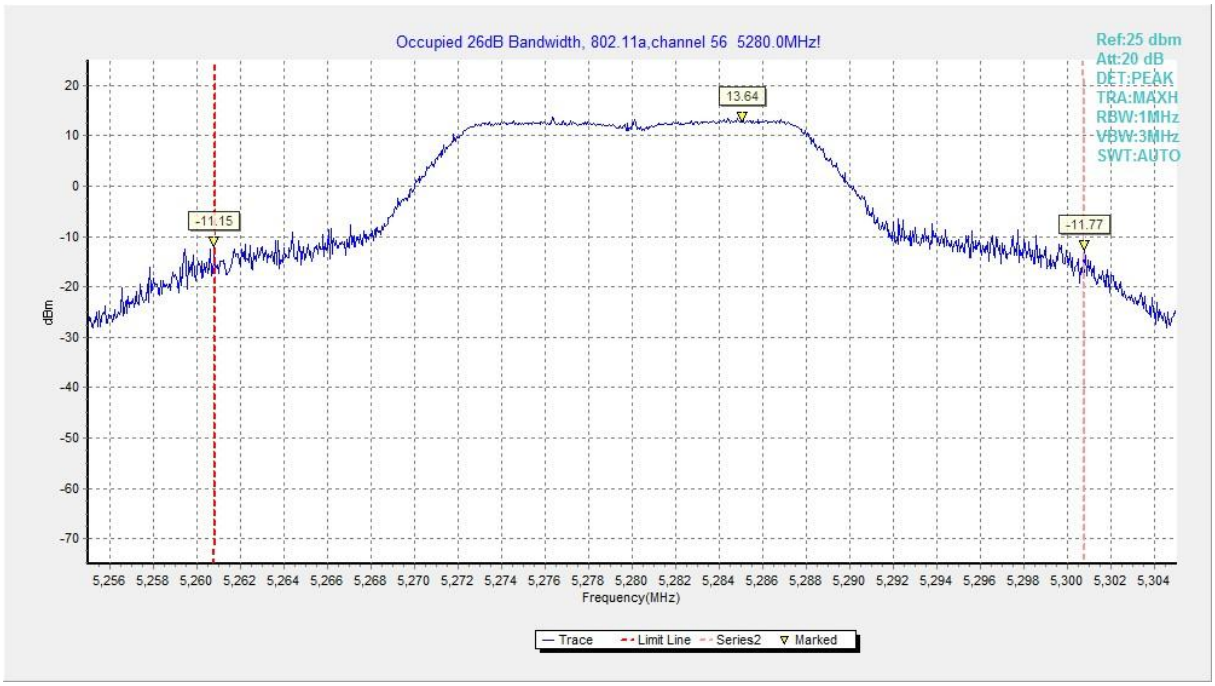


Fig. 5 Occupied 26dB Bandwidth (802.11a, 5280MHz)

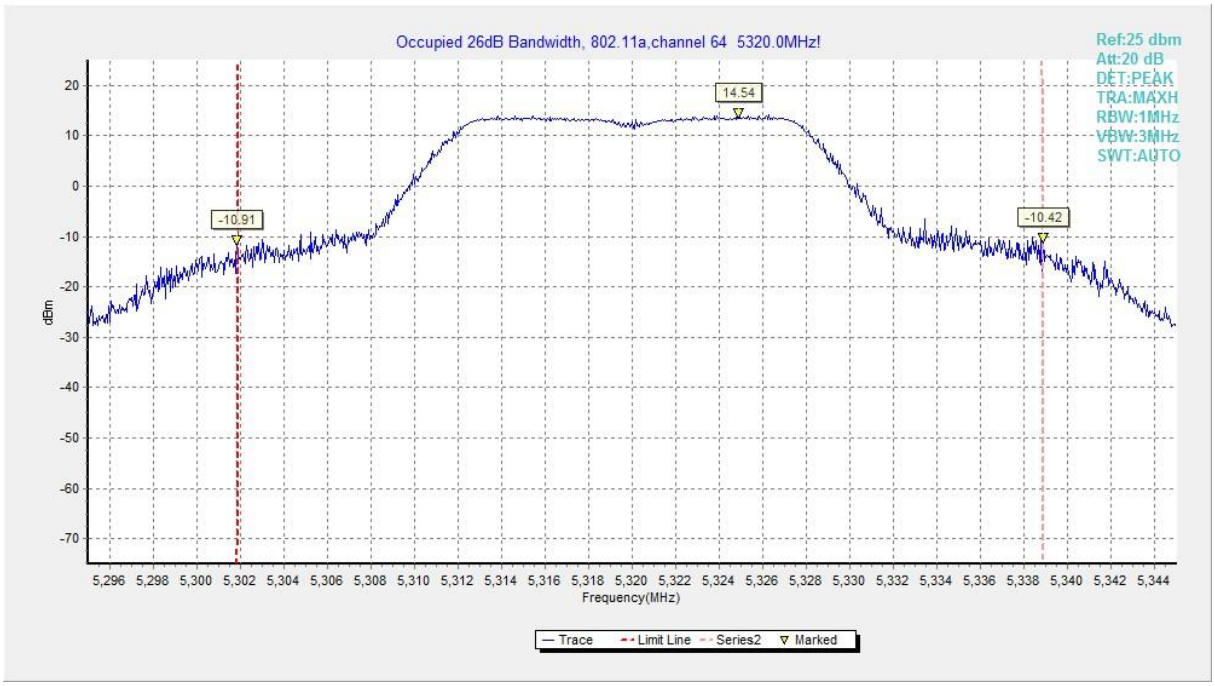


Fig. 6 Occupied 26dB Bandwidth (802.11a, 5320MHz)

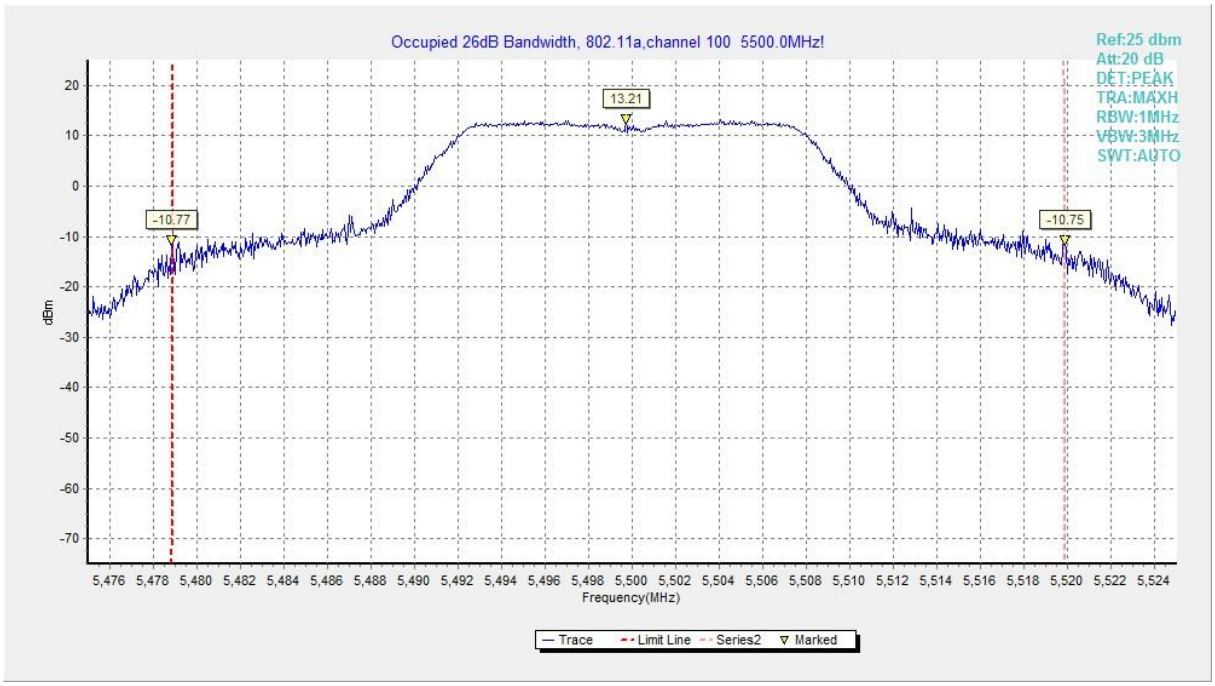


Fig. 7 Occupied 26dB Bandwidth (802.11a, 5500MHz)

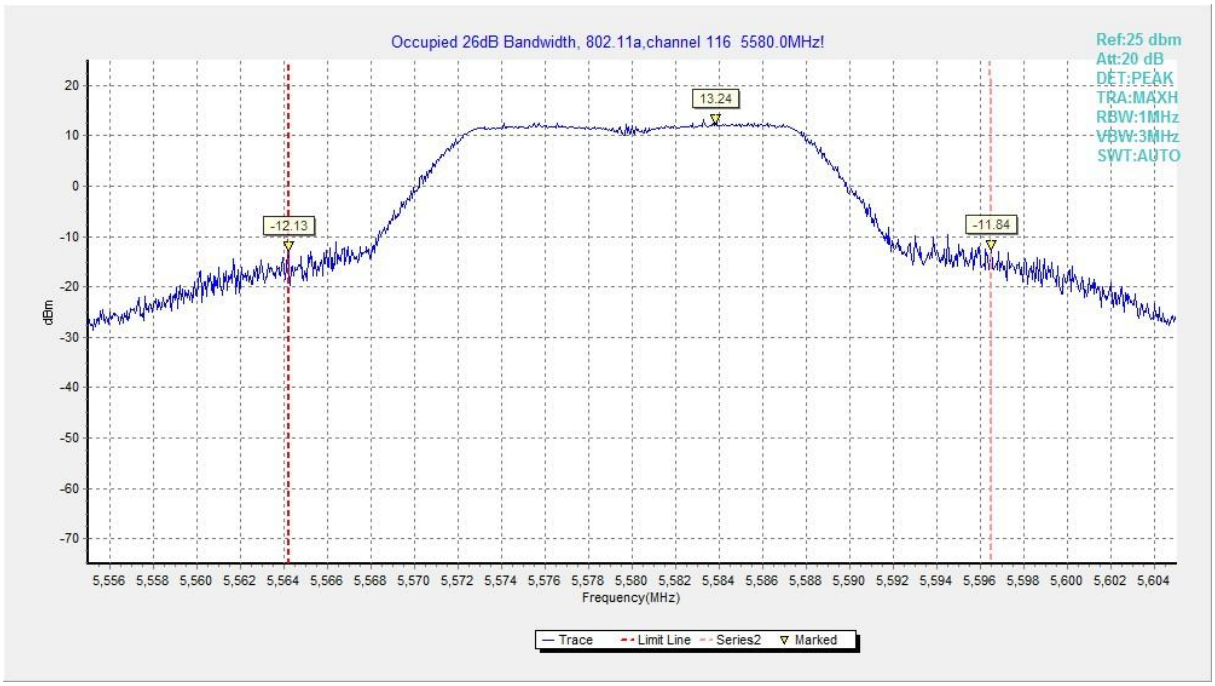


Fig. 8 Occupied 26dB Bandwidth (802.11a, 5580MHz)

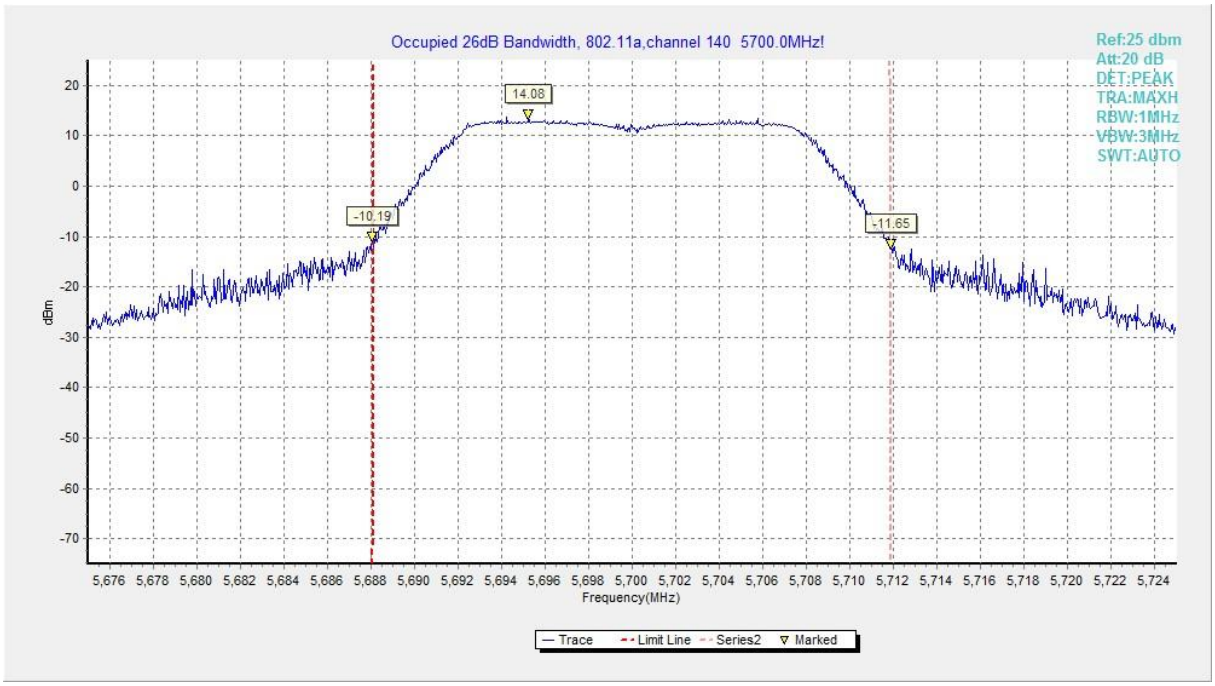


Fig. 9 Occupied 26dB Bandwidth (802.11a, 5700MHz)

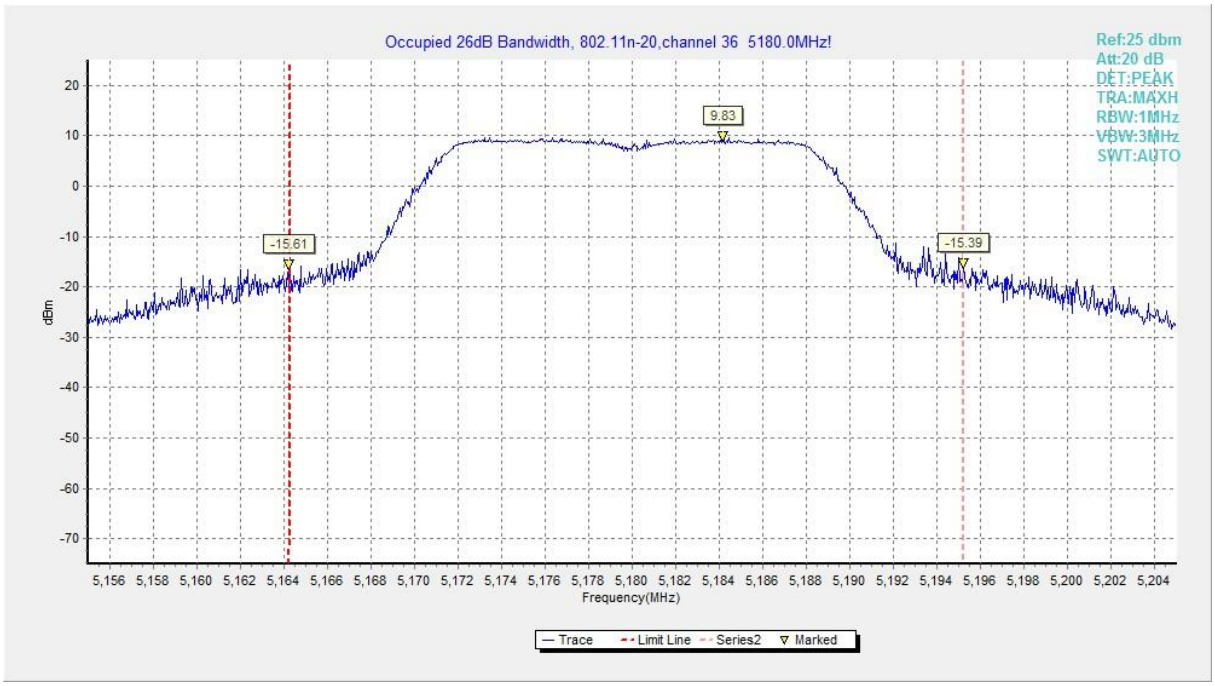


Fig. 10 Occupied 26dB Bandwidth (802.11n-HT20, 5180MHz)

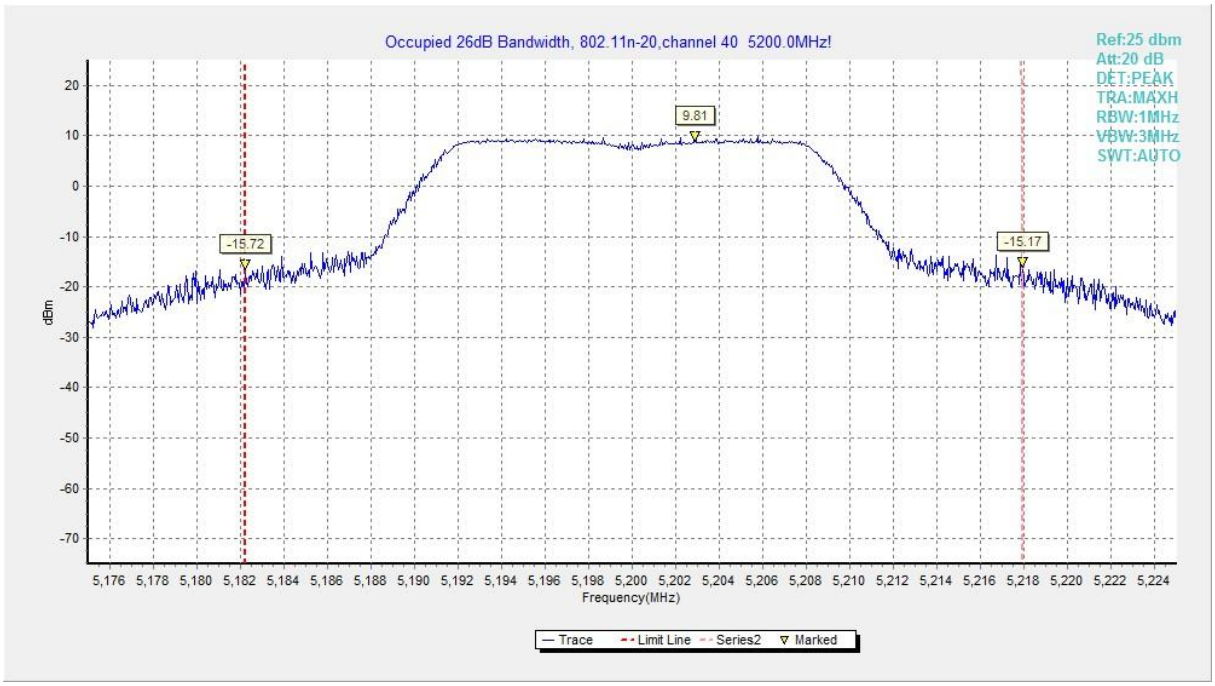


Fig. 11 Occupied 26dB Bandwidth (802.11n-HT20, 5200MHz)

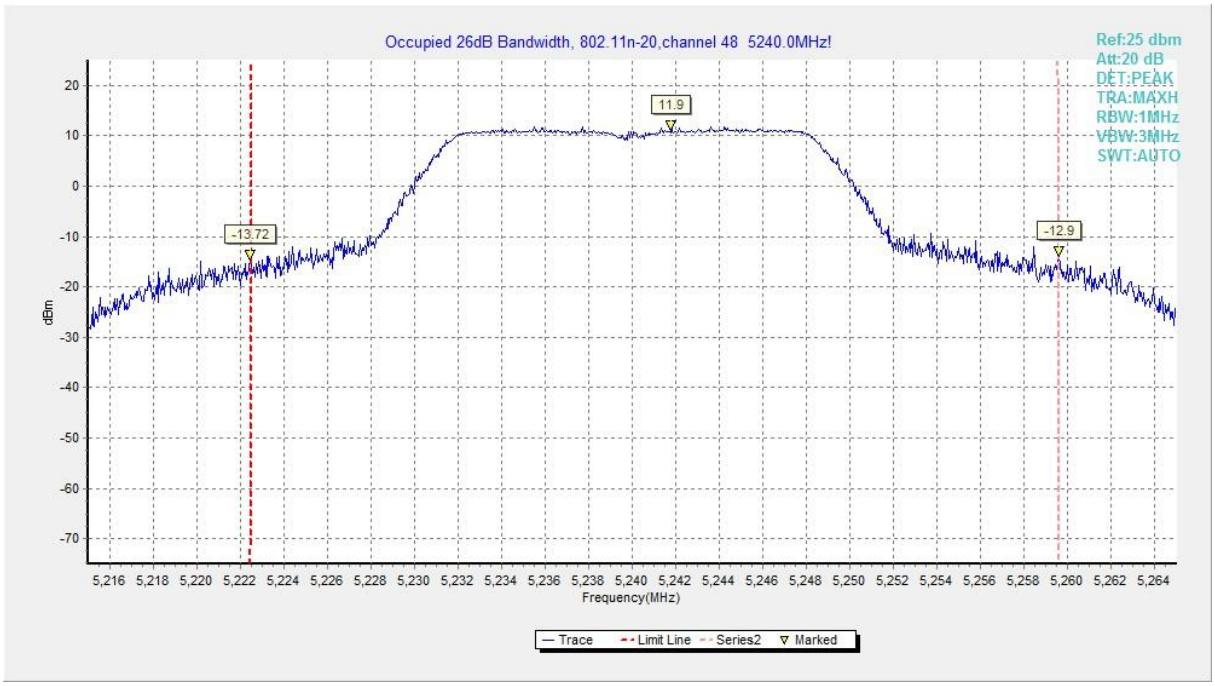


Fig. 12 Occupied 26dB Bandwidth (802.11n-HT20, 5240MHz)

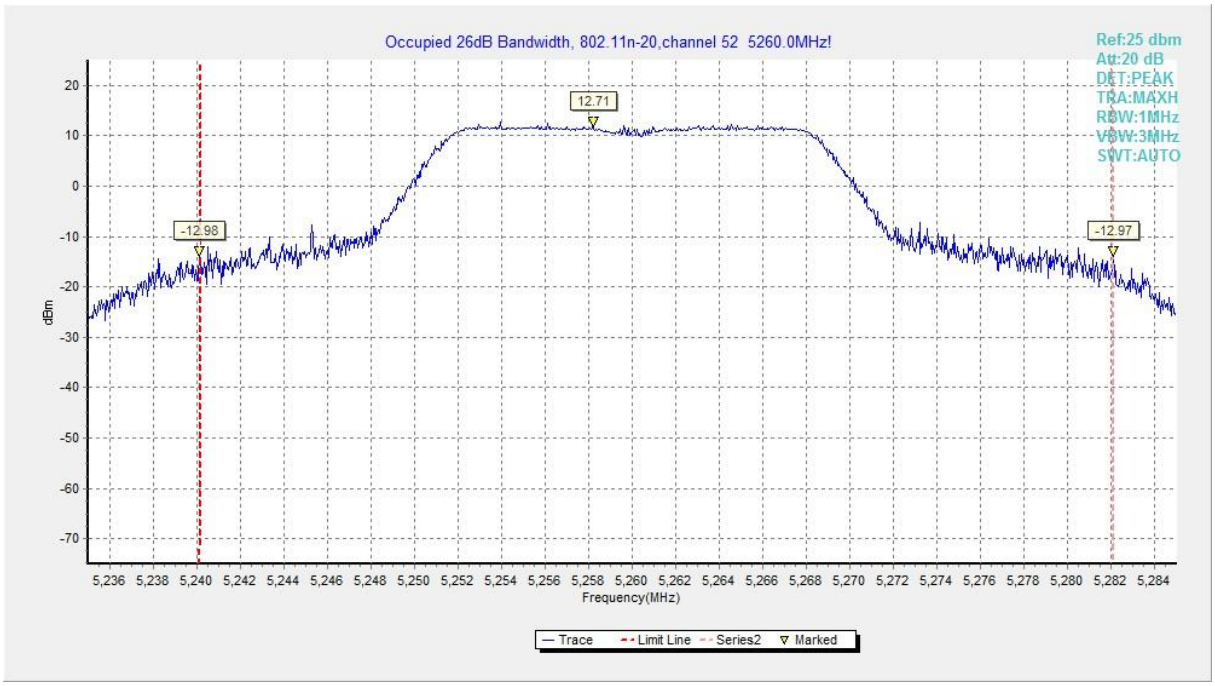


Fig. 13 Occupied 26dB Bandwidth (802.11n-HT20, 5260MHz)

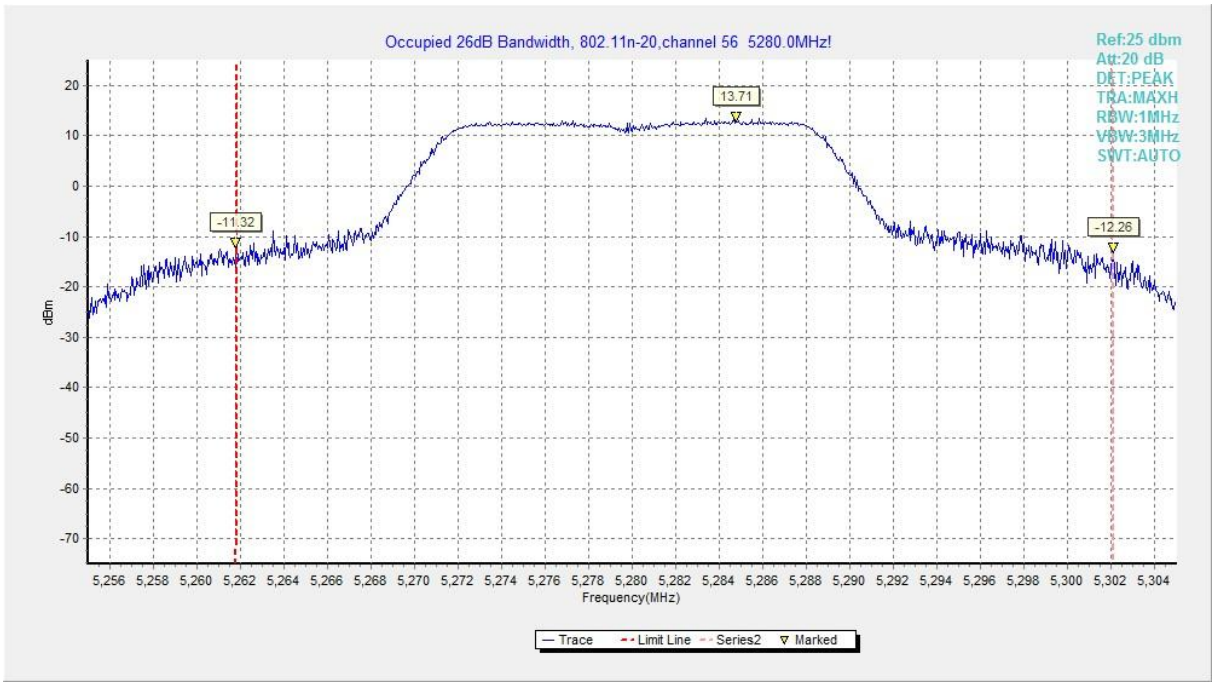


Fig. 14 Occupied 26dB Bandwidth (802.11n-HT20, 5280MHz)

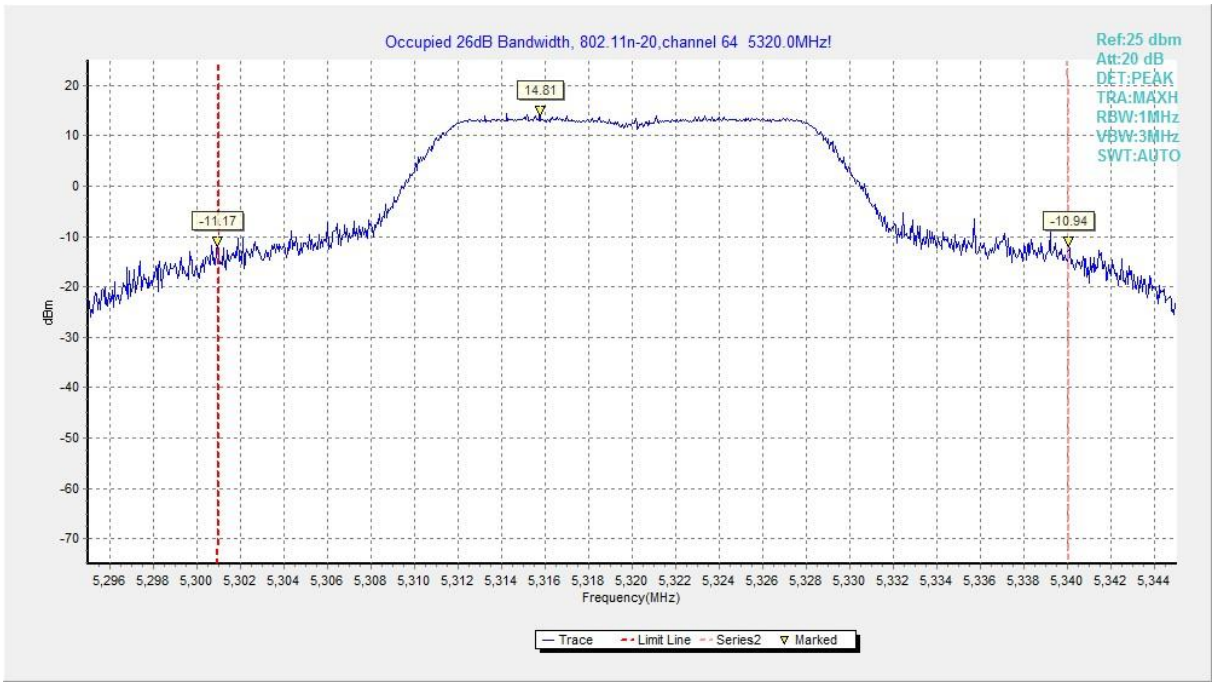


Fig. 15 Occupied 26dB Bandwidth (802.11n-HT20, 5320MHz)

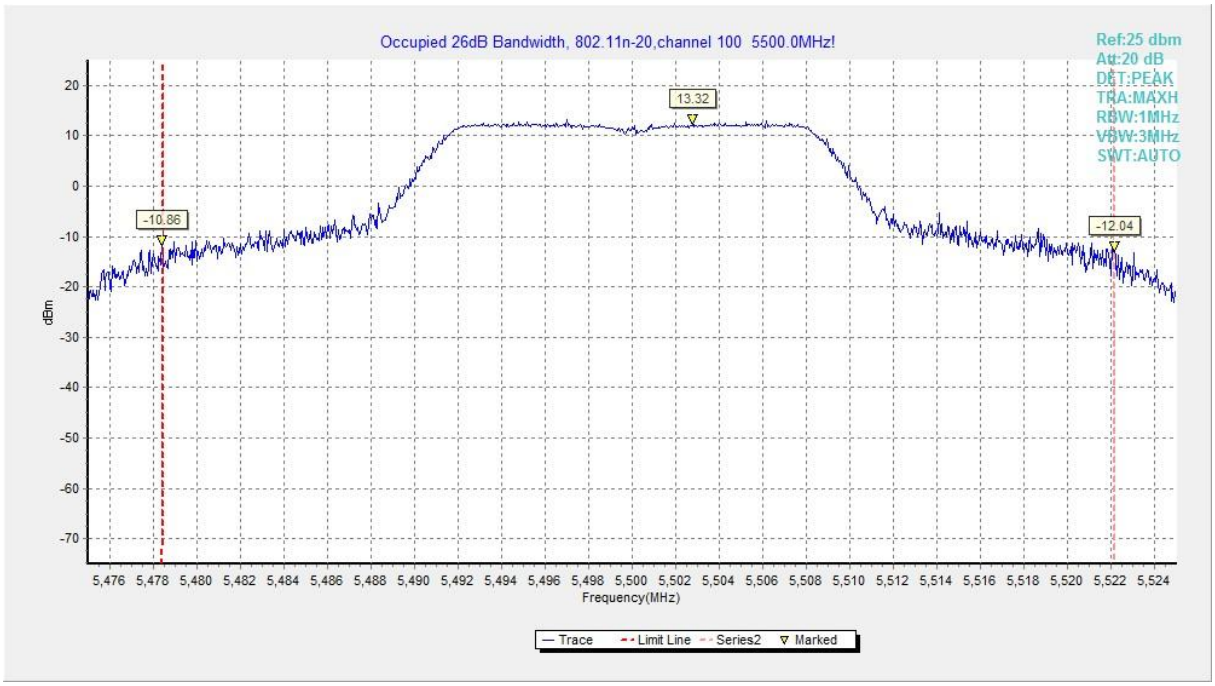


Fig. 16 Occupied 26dB Bandwidth (802. 11n-HT20, 5500MHz)

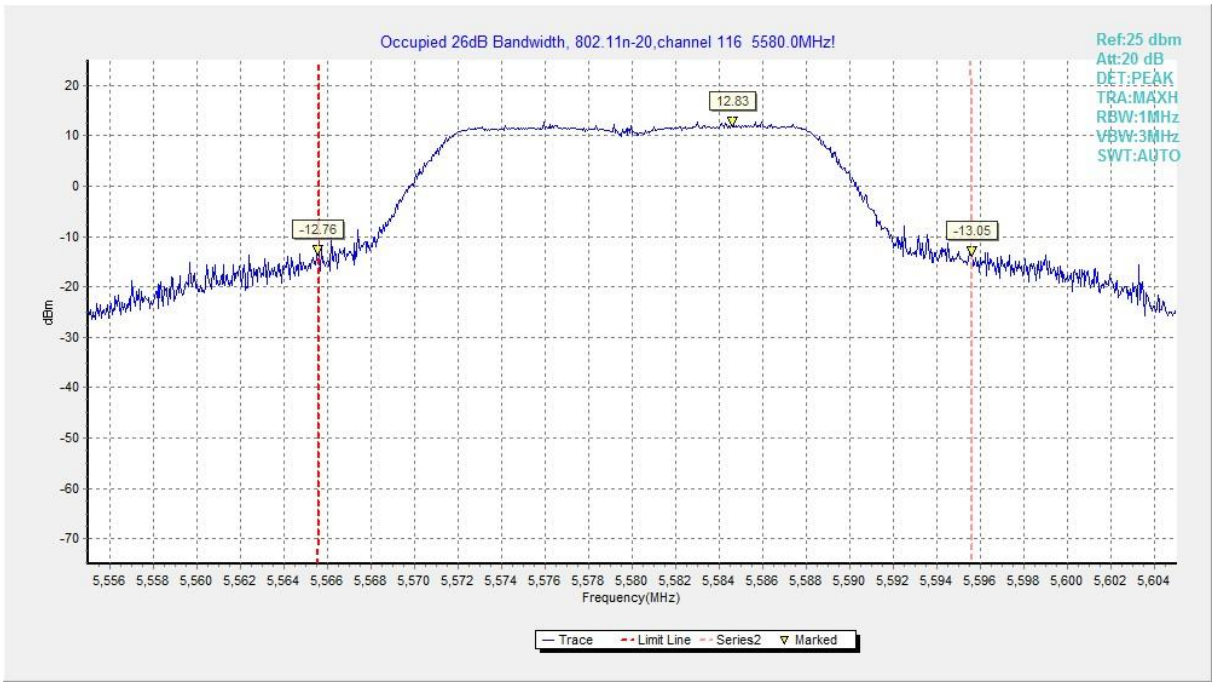


Fig. 17 Occupied 26dB Bandwidth (802. 11n-HT20, 5580MHz)

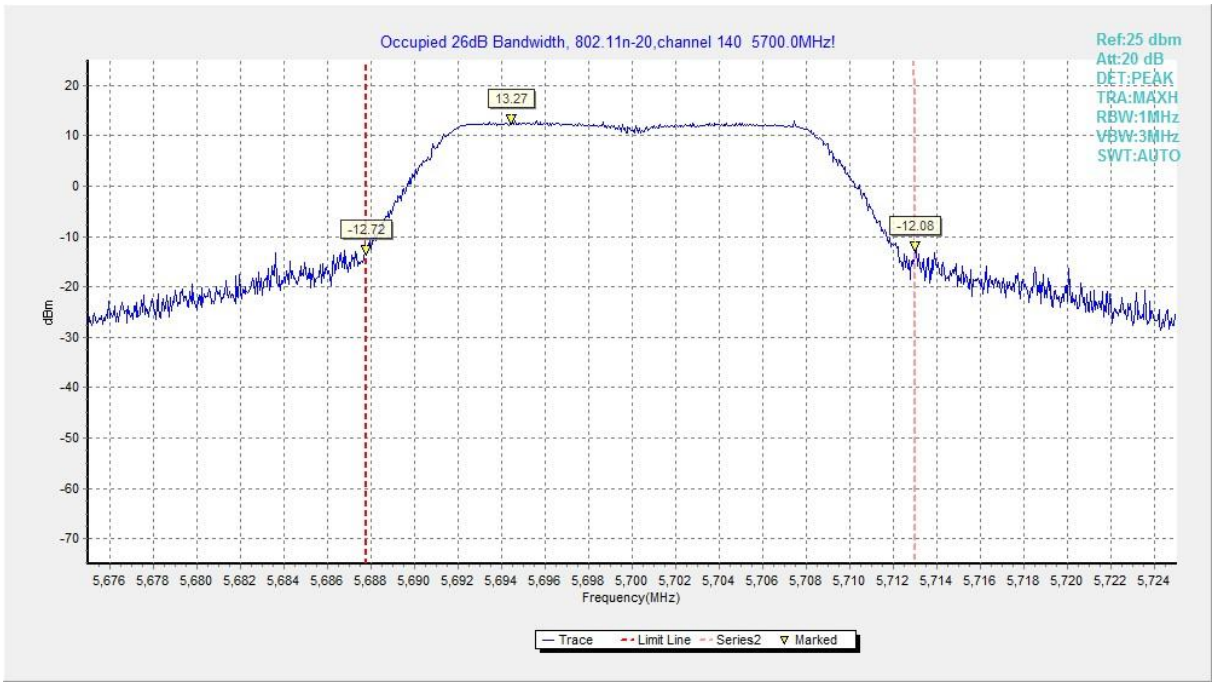


Fig. 18 Occupied 26dB Bandwidth (802. 11n-HT20, 5700MHz)

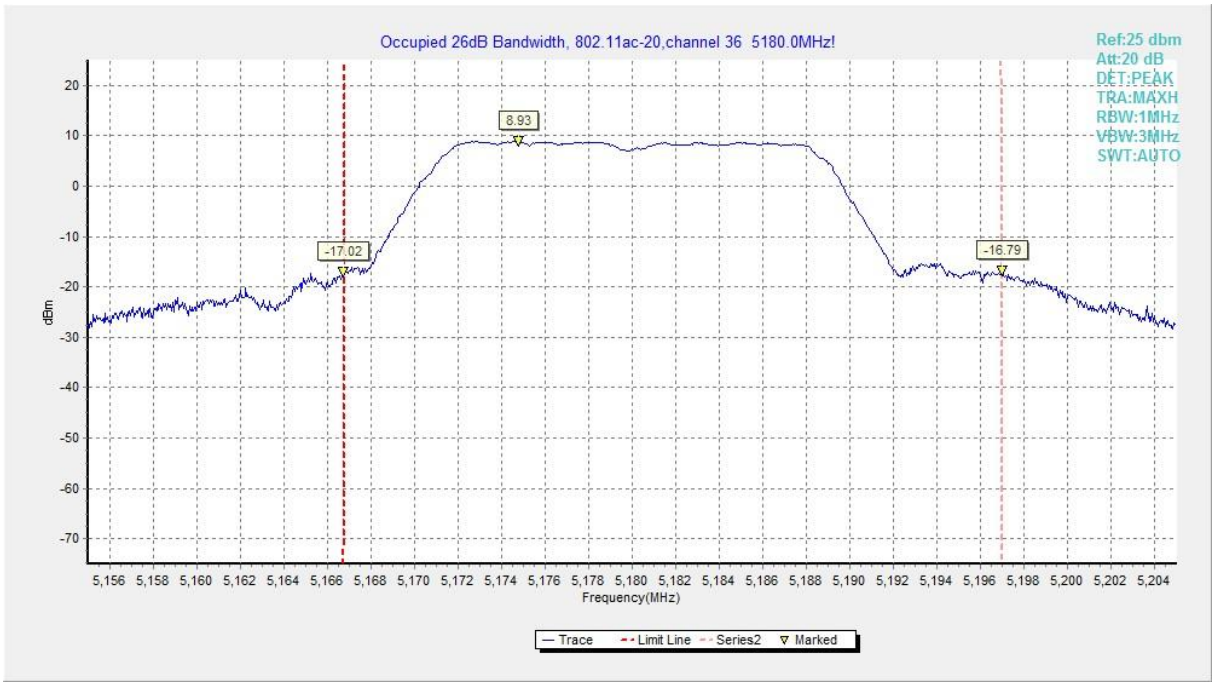


Fig. 19 Occupied 26dB Bandwidth (802.11ac-HT20, 5180MHz)

Fig. 20 Occupied 26dB Bandwidth (802.11ac-HT20, 5200MHz)

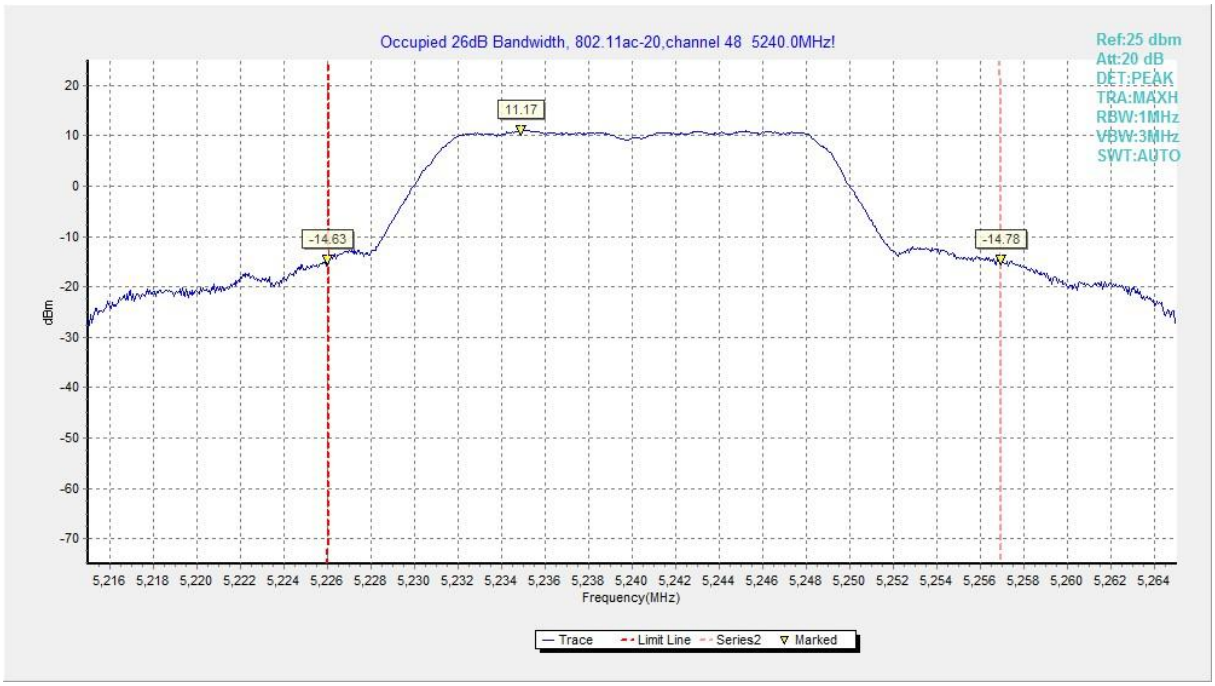


Fig. 21 Occupied 26dB Bandwidth (802.11ac-HT20, 5240MHz)

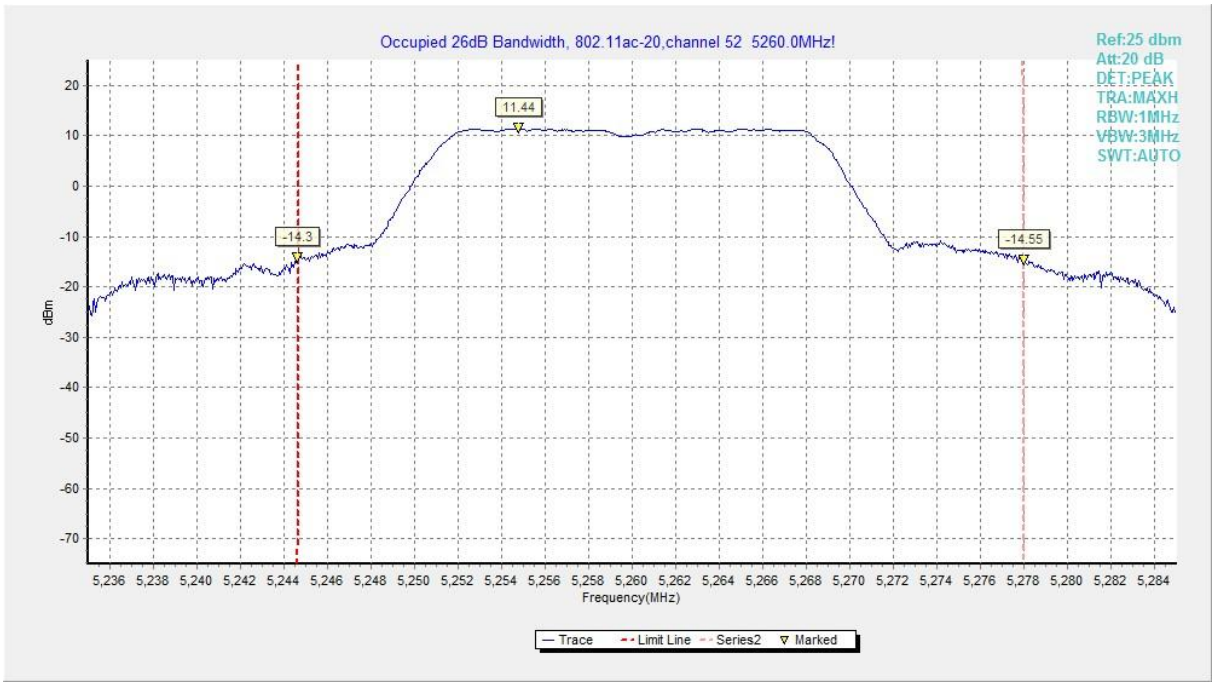


Fig. 22 Occupied 26dB Bandwidth (802.11ac-HT20, 5260MHz)

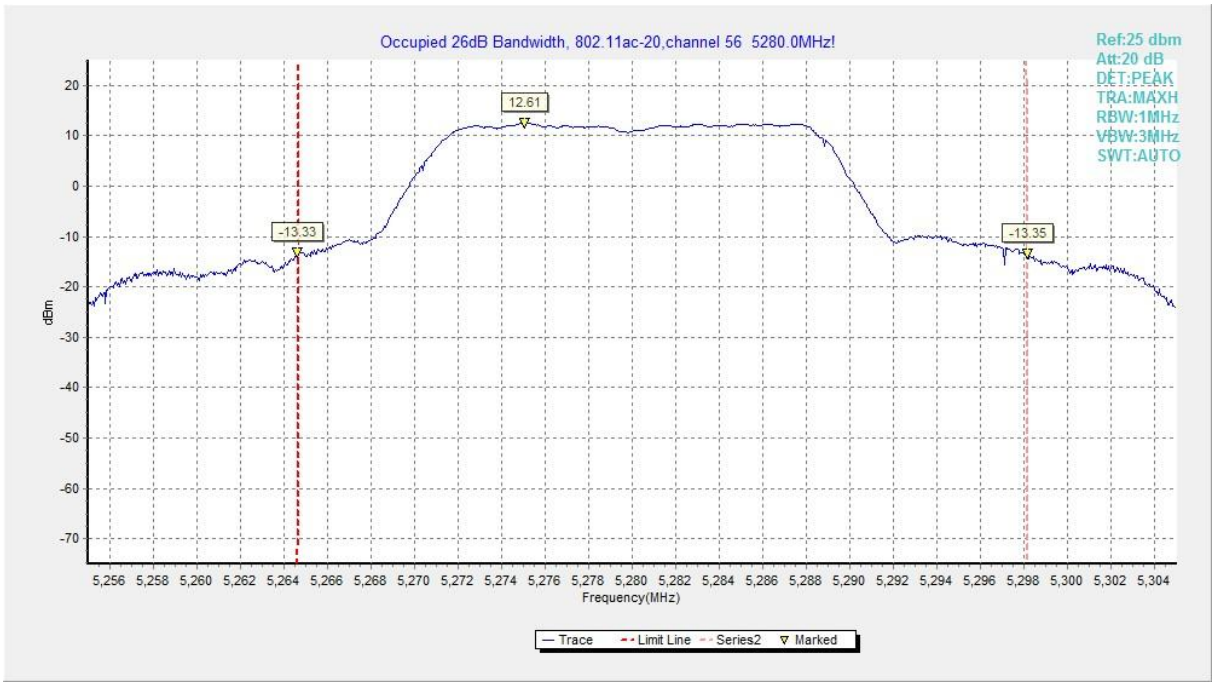


Fig. 23 Occupied 26dB Bandwidth (802.11ac-HT20, 5280MHz)

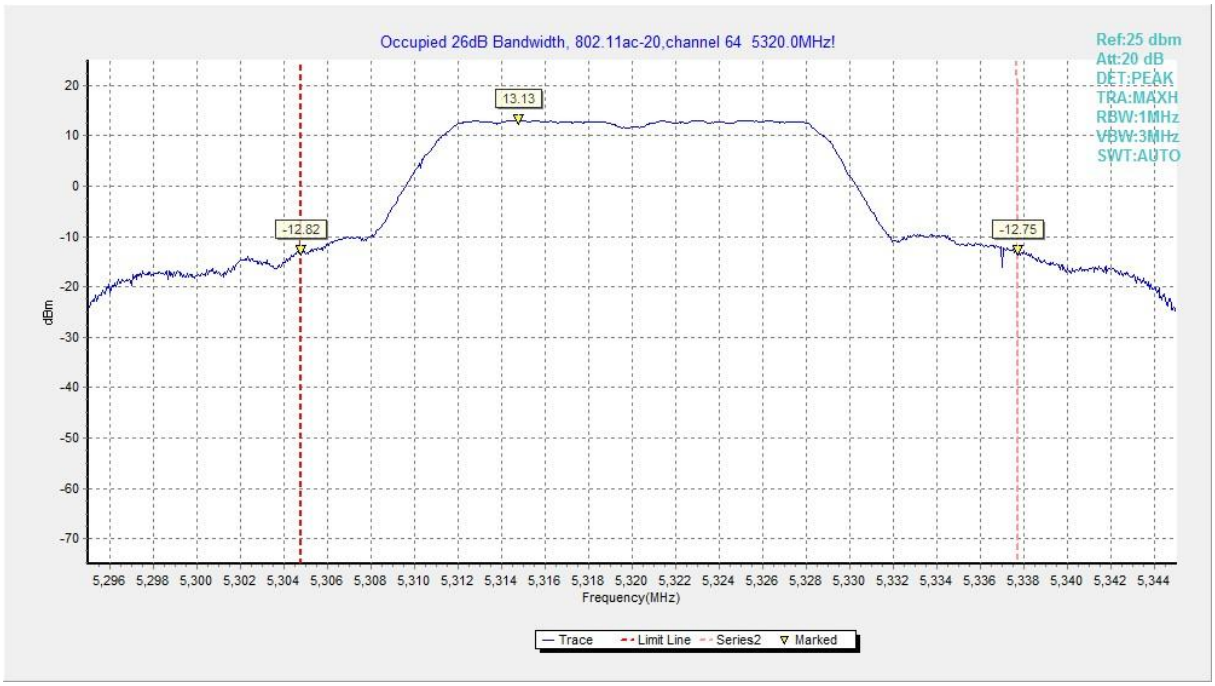


Fig. 24 Occupied 26dB Bandwidth (802.11ac-HT20, 5320MHz)

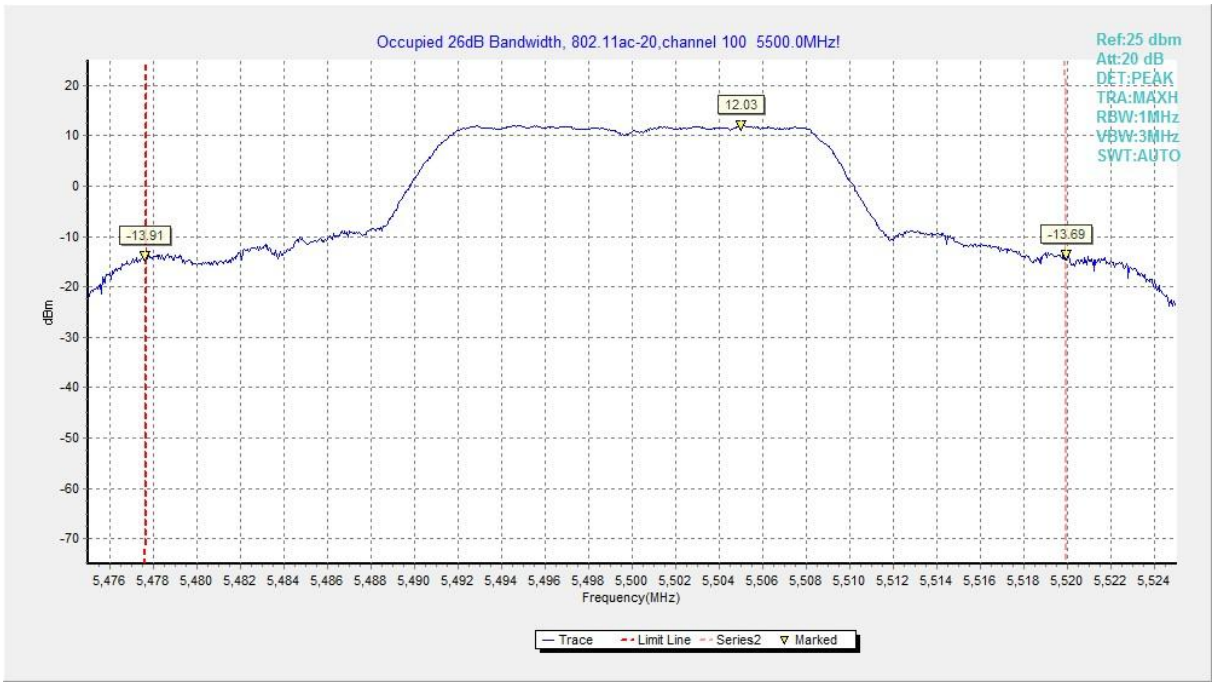


Fig. 25 Occupied 26dB Bandwidth (802. 11ac-HT20, 5500MHz)

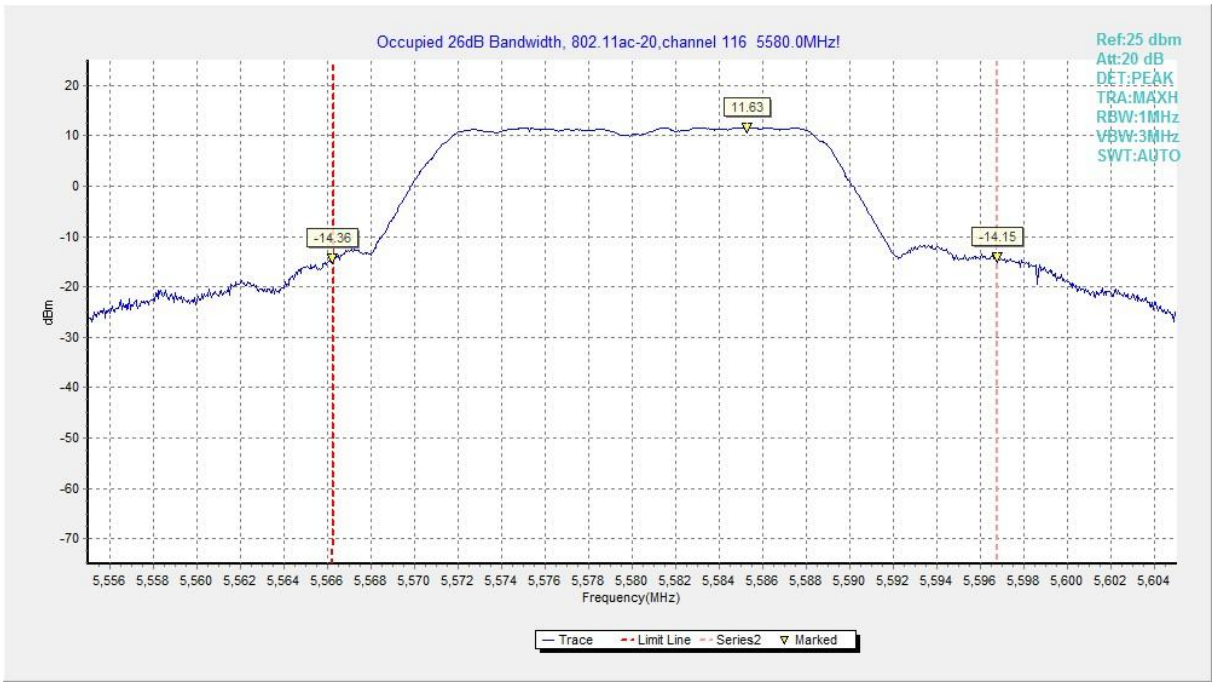


Fig. 26 Occupied 26dB Bandwidth (802. 11ac-HT20, 5580MHz)

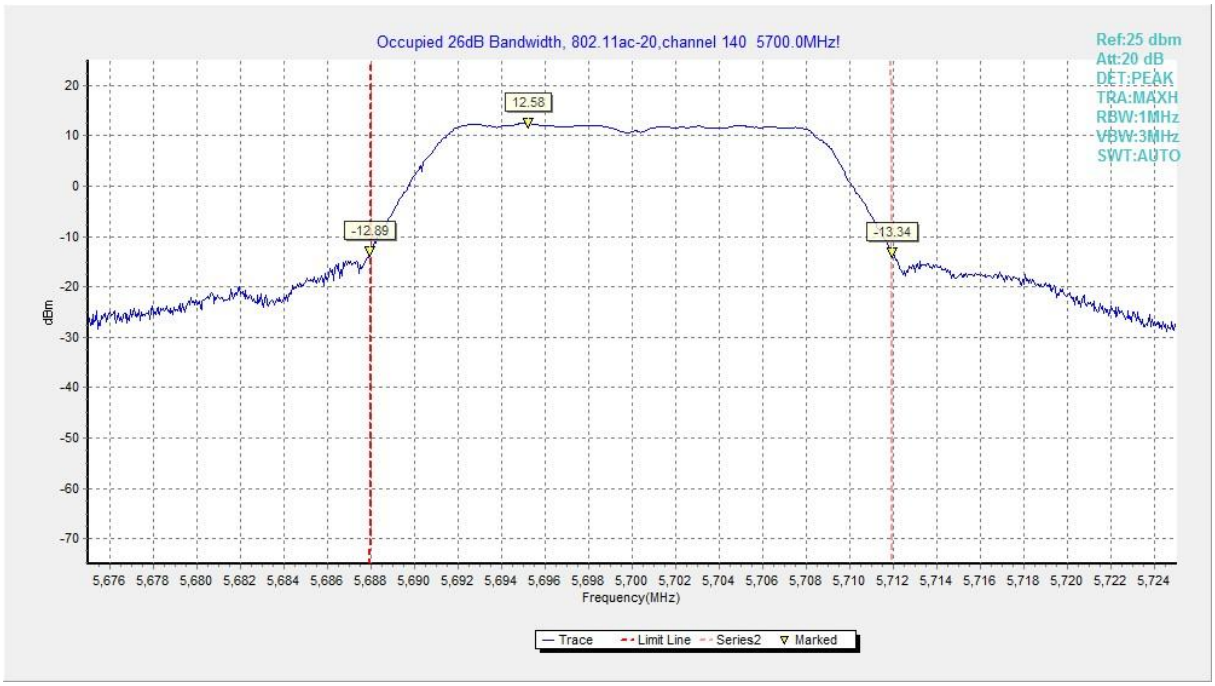


Fig. 27 Occupied 26dB Bandwidth (802. 11ac-HT20, 5700MHz)

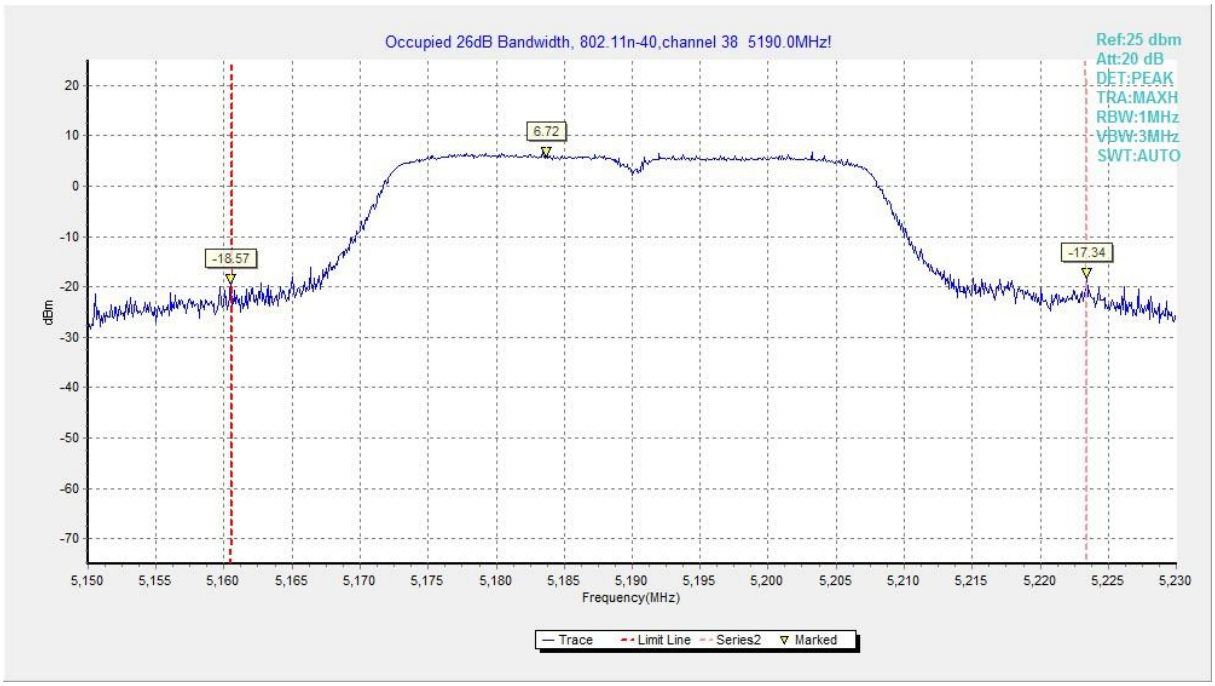


Fig. 28 Occupied 26dB Bandwidth (802.11n-HT40, 5190MHz)

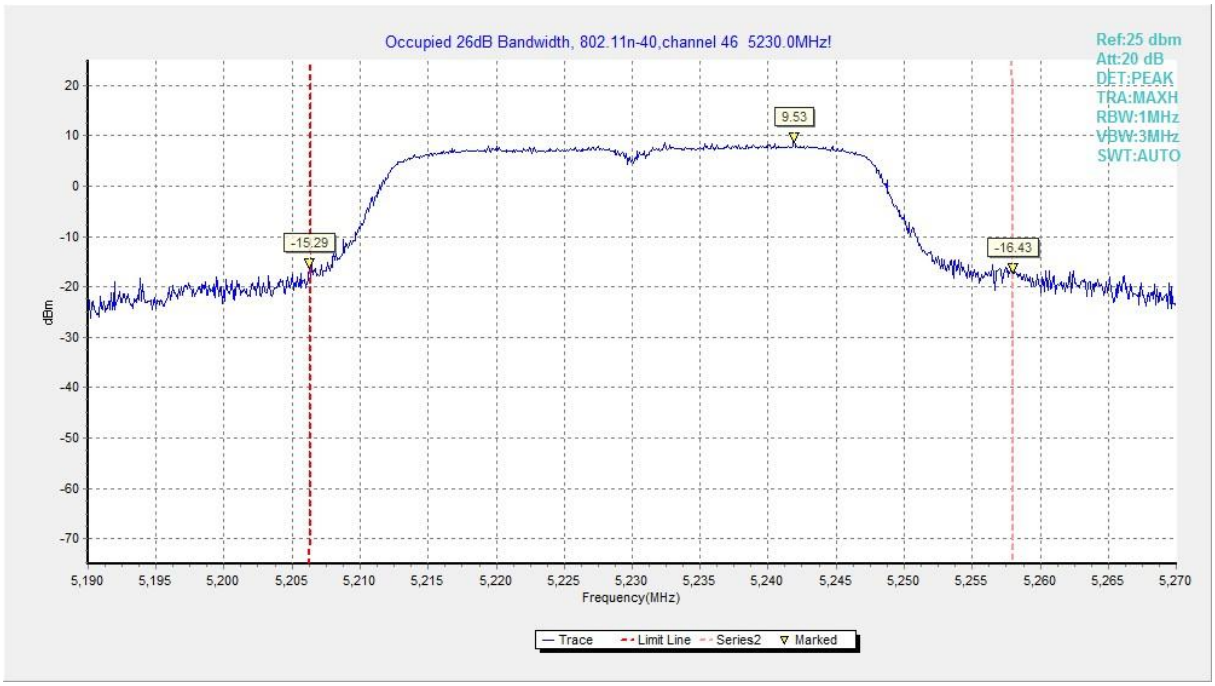


Fig. 29 Occupied 26dB Bandwidth (802.11n-HT40, 5230MHz)

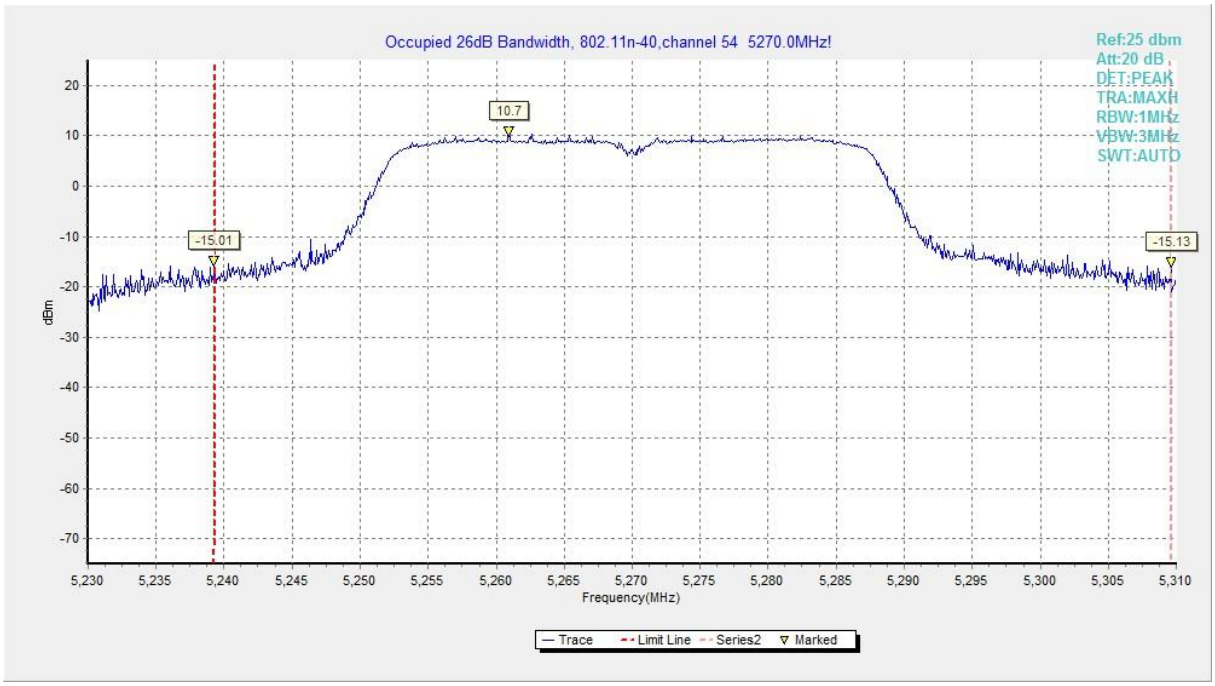


Fig. 30 Occupied 26dB Bandwidth (802.11n-HT40, 5270MHz)

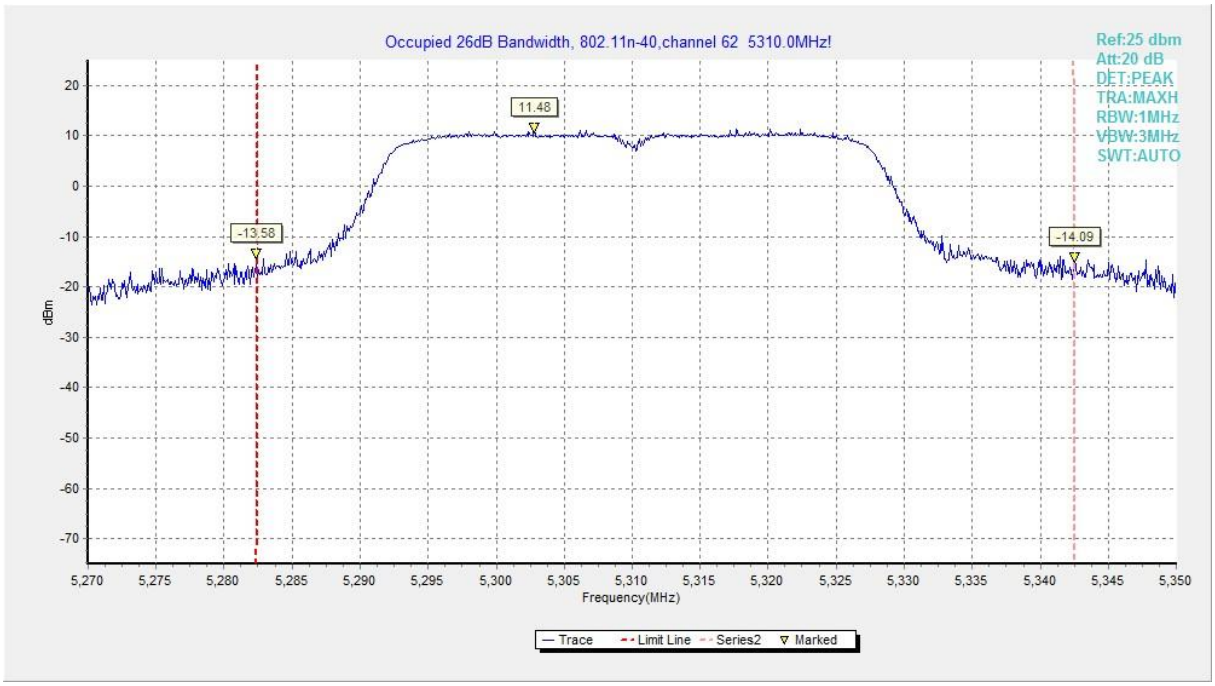


Fig. 31 Occupied 26dB Bandwidth (802.11n-HT40, 5310MHz)

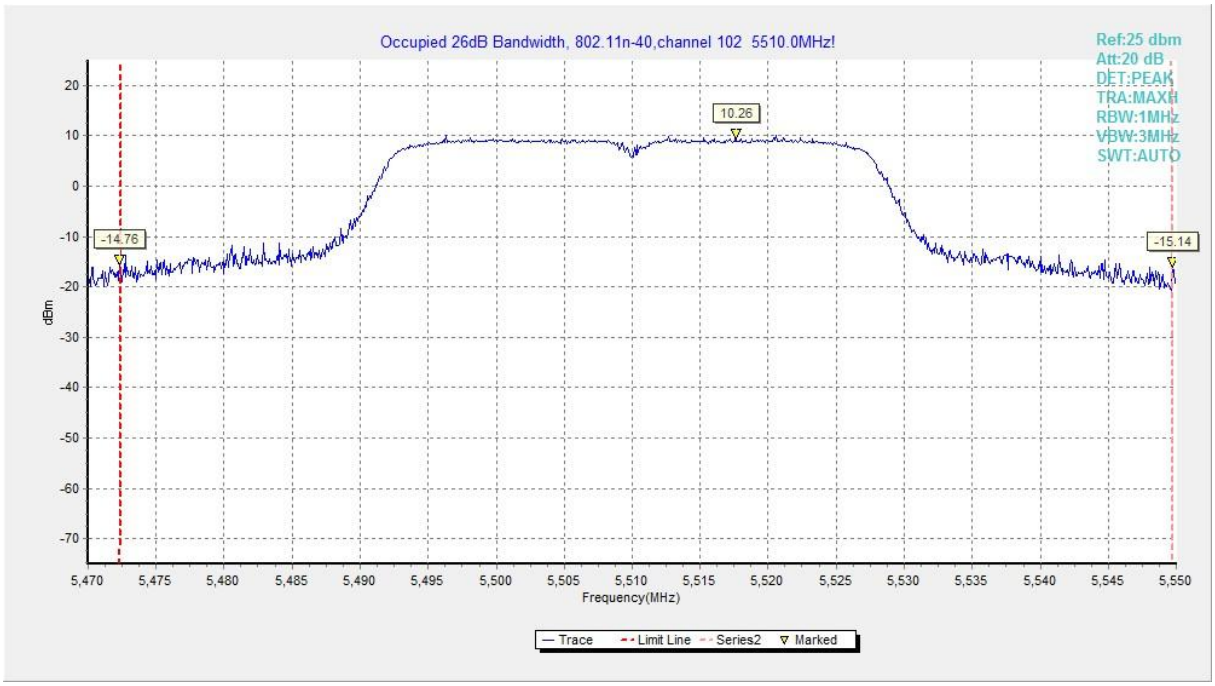


Fig. 32 Occupied 26dB Bandwidth (802. 11n-HT40, 5510MHz)

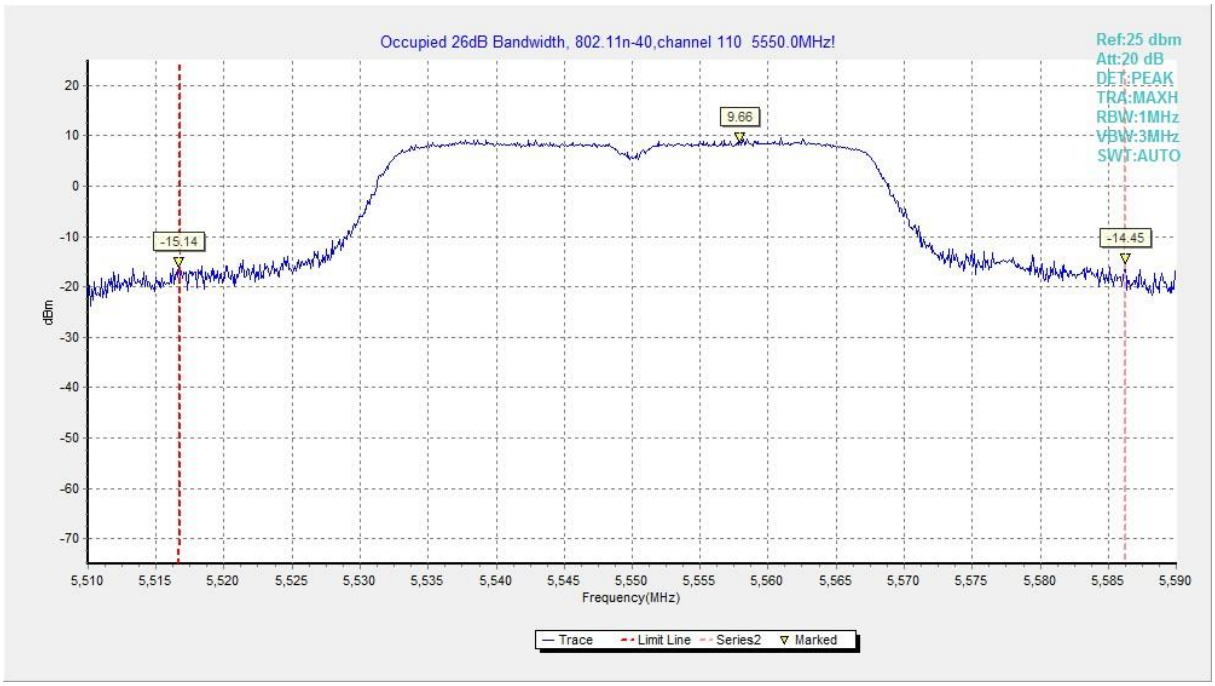


Fig. 33 Occupied 26dB Bandwidth (802. 11n-HT40, 5550MHz)

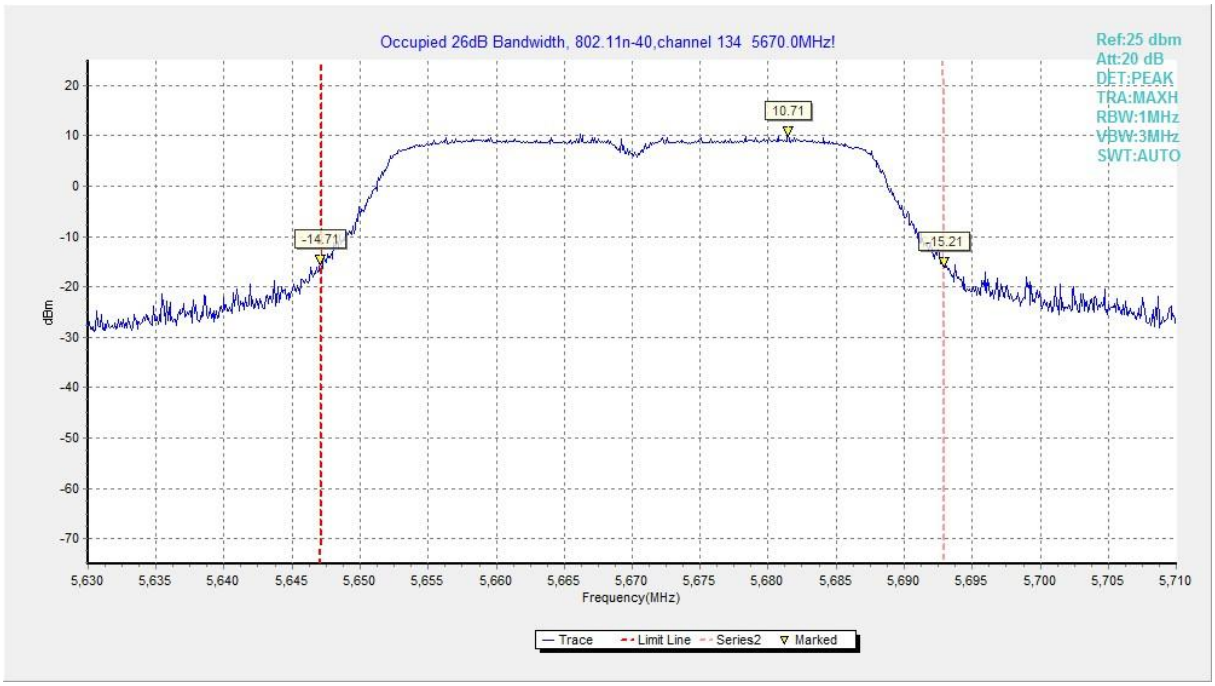


Fig. 34 Occupied 26dB Bandwidth (802. 11n-HT40, 5670MHz)

Fig. 35 Occupied 26dB Bandwidth (802.11ac-HT40, 5190MHz)

Fig. 36 Occupied 26dB Bandwidth (802.11ac-HT40, 5230MHz)

Fig. 37 Occupied 26dB Bandwidth (802.11ac-HT40, 5270MHz)

Fig. 38 Occupied 26dB Bandwidth (802.11ac-HT40, 5310MHz)

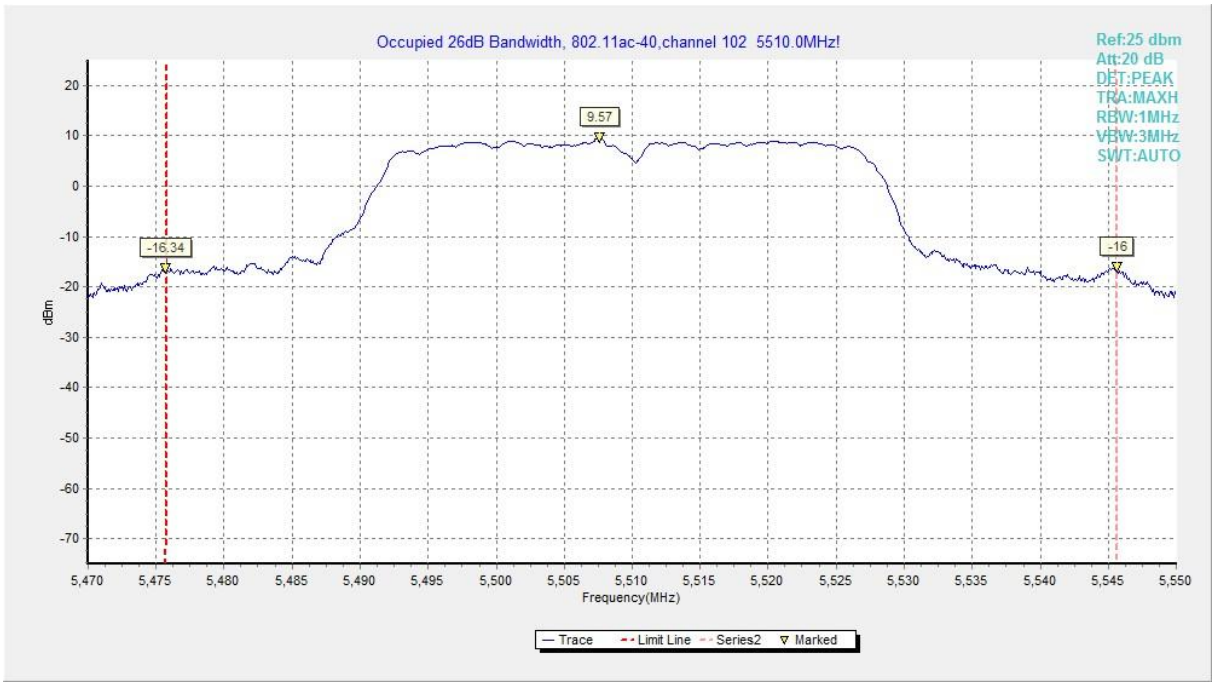


Fig. 39 Occupied 26dB Bandwidth (802. 11ac-HT40, 5510MHz)

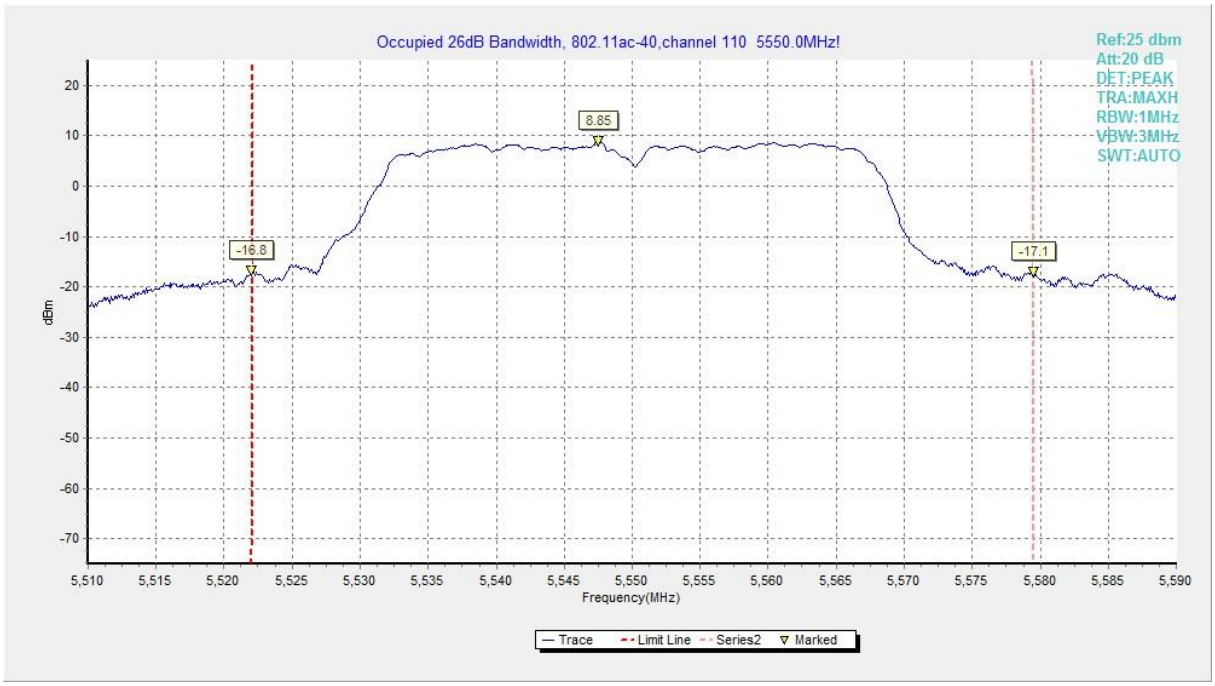


Fig. 40 Occupied 26dB Bandwidth (802. 11ac-HT40, 5550MHz)

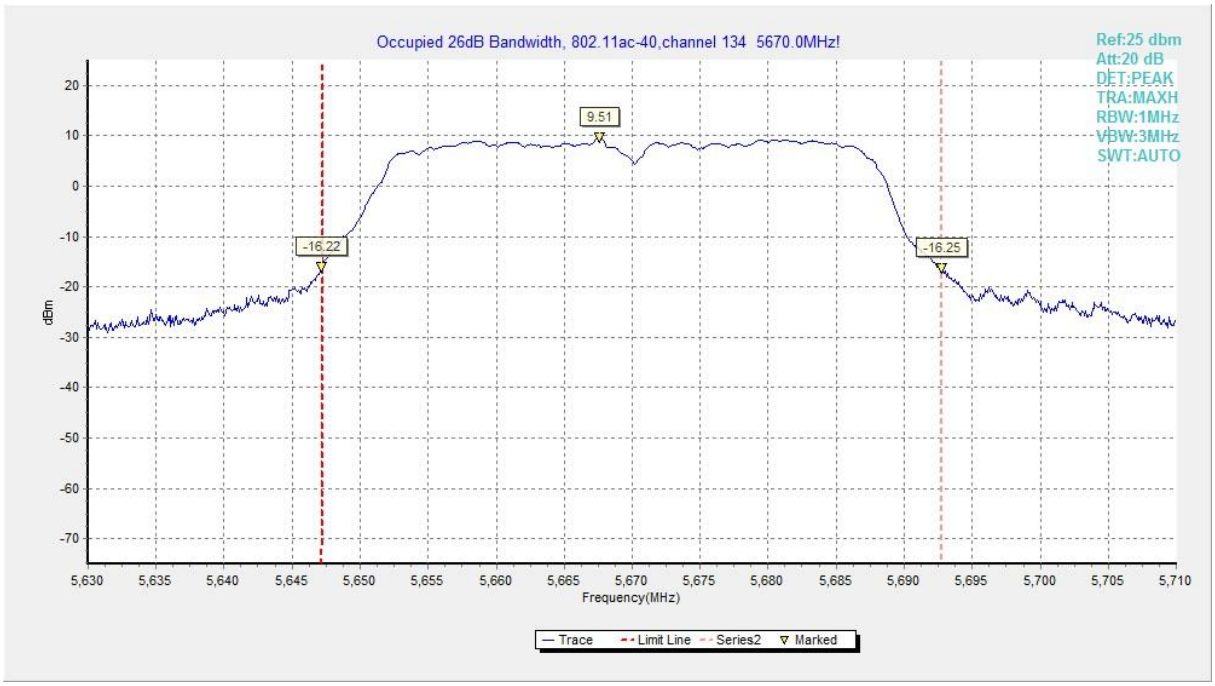


Fig. 41 Occupied 26dB Bandwidth (802. 11ac-HT40, 5670MHz)

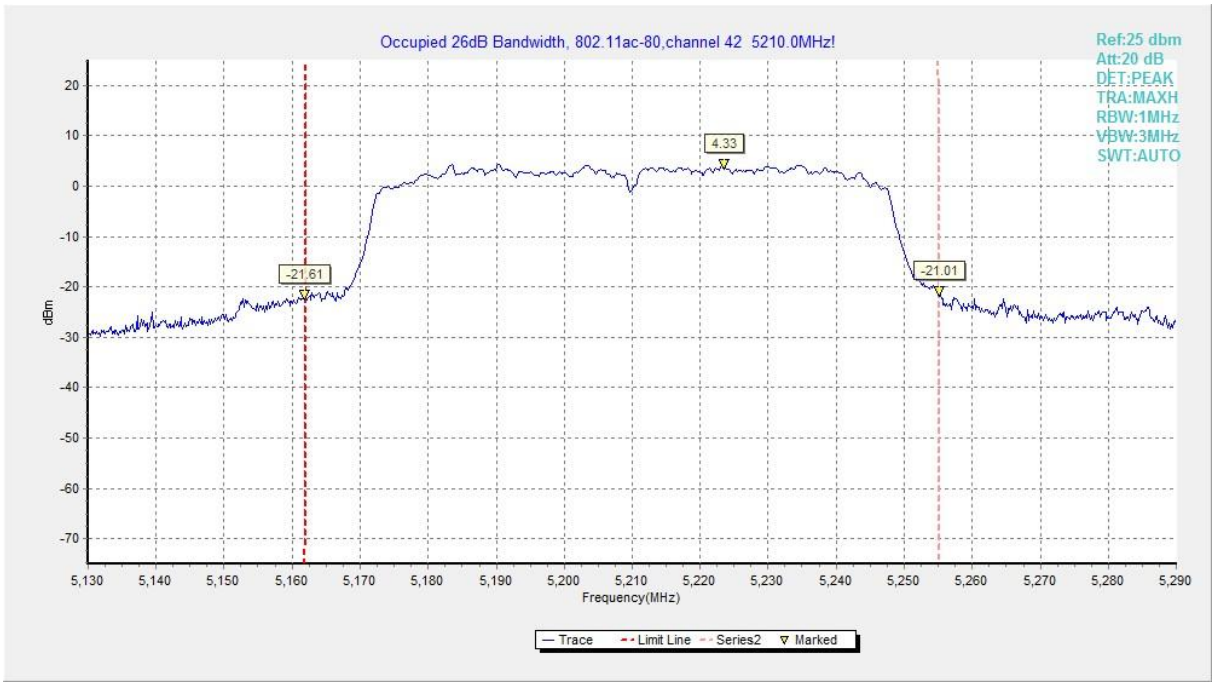


Fig. 42 Occupied 26dB Bandwidth (802. 11ac-HT80, 5210MHz)

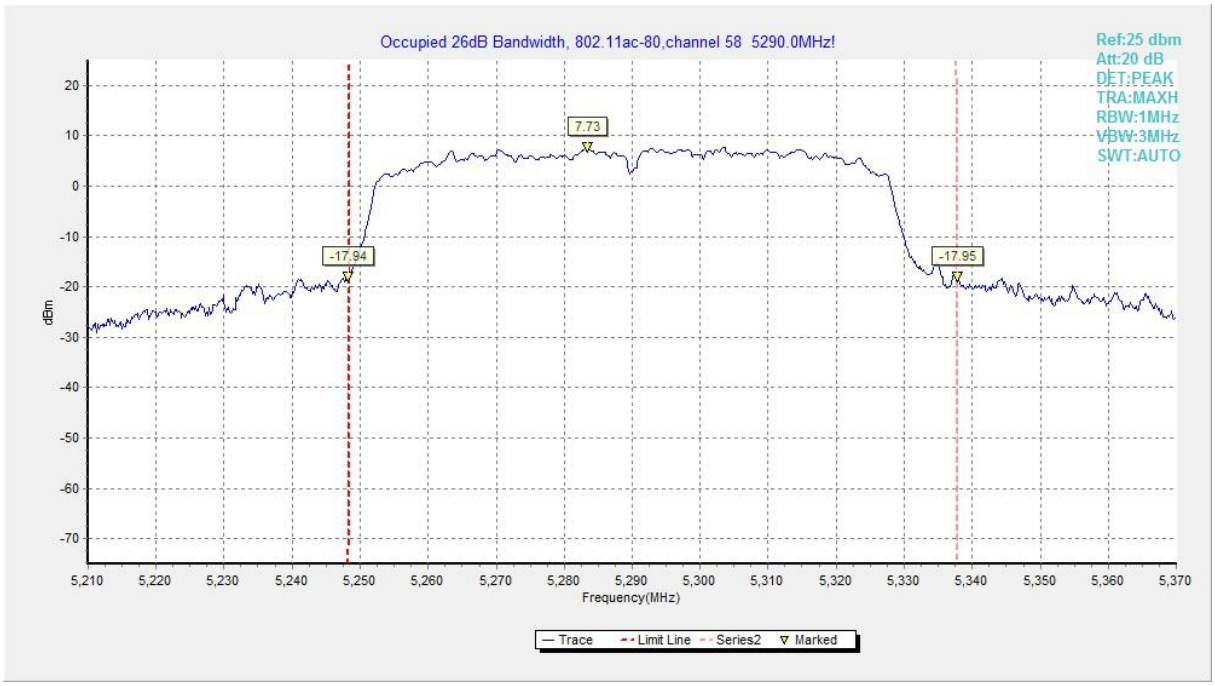


Fig. 43 Occupied 26dB Bandwidth (802. 11ac-HT80, 5290MHz)

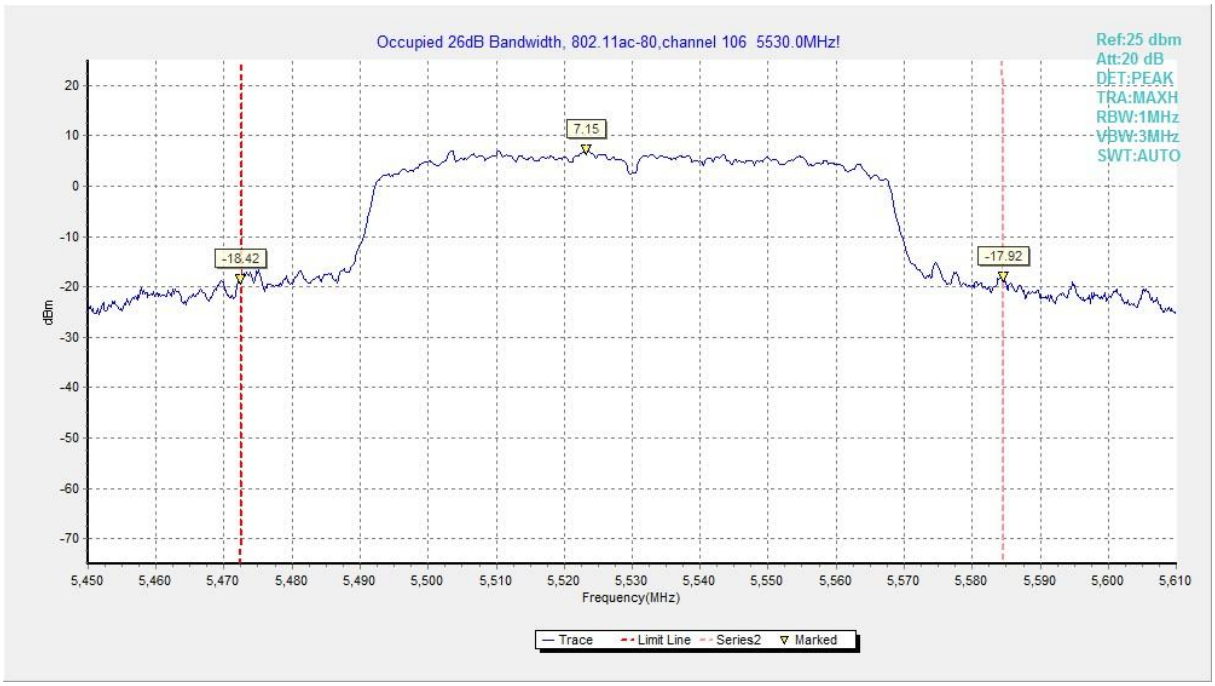


Fig. 44 Occupied 26dB Bandwidth (802. 11ac-HT80, 5530MHz)

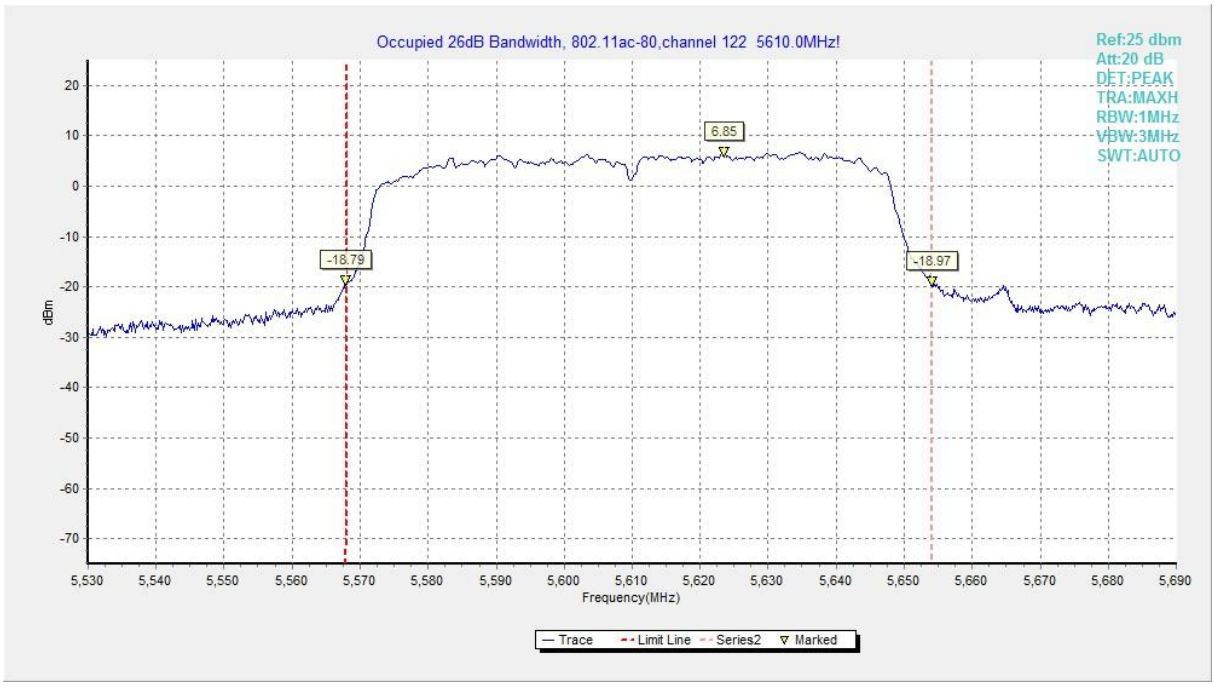


Fig. 45 Occupied 26dB Bandwidth (802. 11ac-HT80, 5610MHz)

A.5. Band Edges Compliancy

A5.1 Band Edges - Radiated

Measurement Limit:

Standard	Limit (dBμ V/m)	
FCC 47 CFR Part 15.209	Peak	74
	Average	54

The measurement is made according to KDB 789033
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)).

Measurement Uncertainty:

Measurement Uncertainty	5.26dB

Measurement Result:

Mode	Channel	Test Results	Conclusion
802.11a	5180 MHz	Fig.46	P
	5320 MHz	Fig.47	P
	5500 MHz	Fig.48	P
	5700 MHz	Fig.49	P
802.11n HT20	5180 MHz	Fig.50	P
	5320 MHz	Fig.51	P
	5500 MHz	Fig.52	P
	5700 MHz	Fig.53	P
802.11n HT40	5190 MHz	Fig.54	P
	5310 MHz	Fig.55	P
	5510 MHz	Fig.56	P
	5670 MHz	Fig.57	P
802.11ac HT80	5210MHz	Fig.58	P
	5290MHz	Fig.59	P
	5530MHz	Fig.60	P

Conclusion: PASS
Test graphs as below:

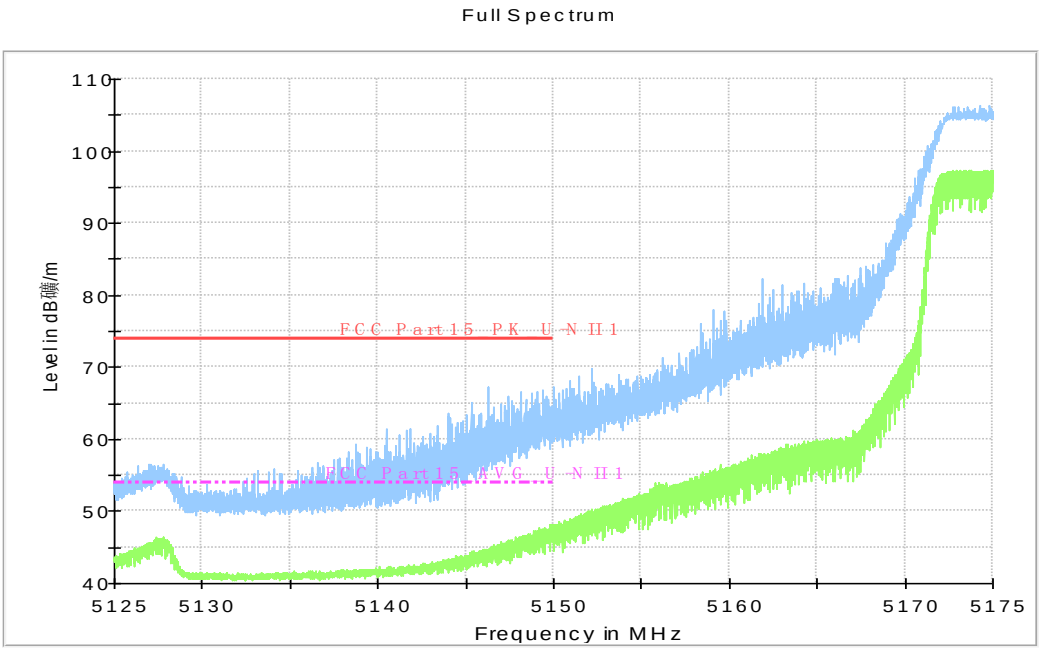


Fig. 46 Band Edges (802.11a, 5180MHz)

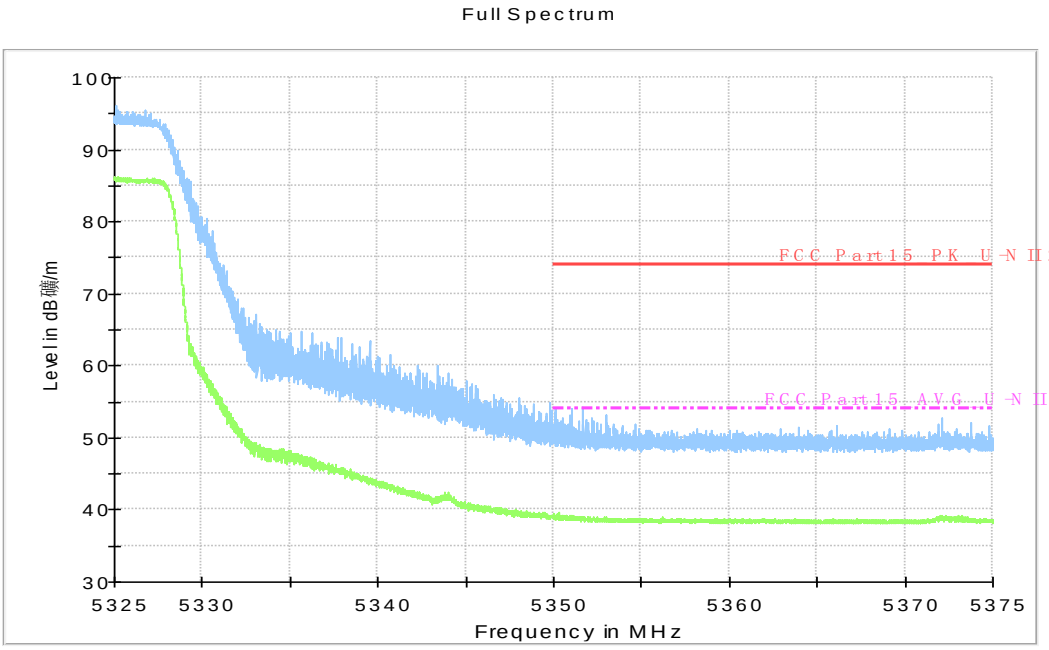


Fig. 47 Band Edges (802.11a, 5320MHz)

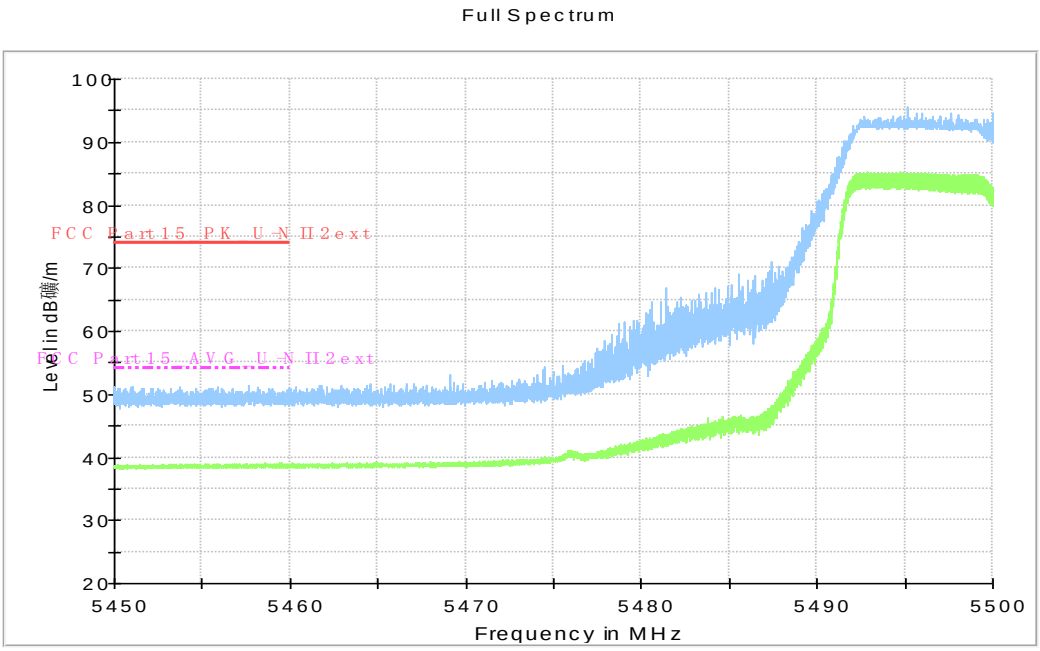


Fig. 48 Band Edges (802.11a, 5500MHz)

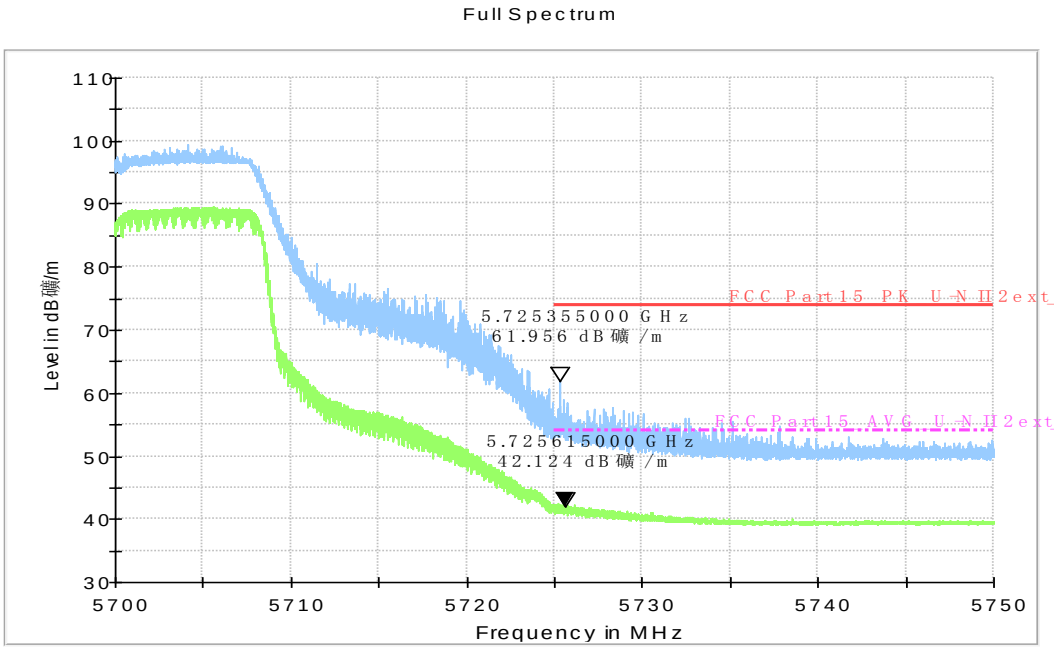


Fig. 49 Band Edges (802.11a, 5700MHz)

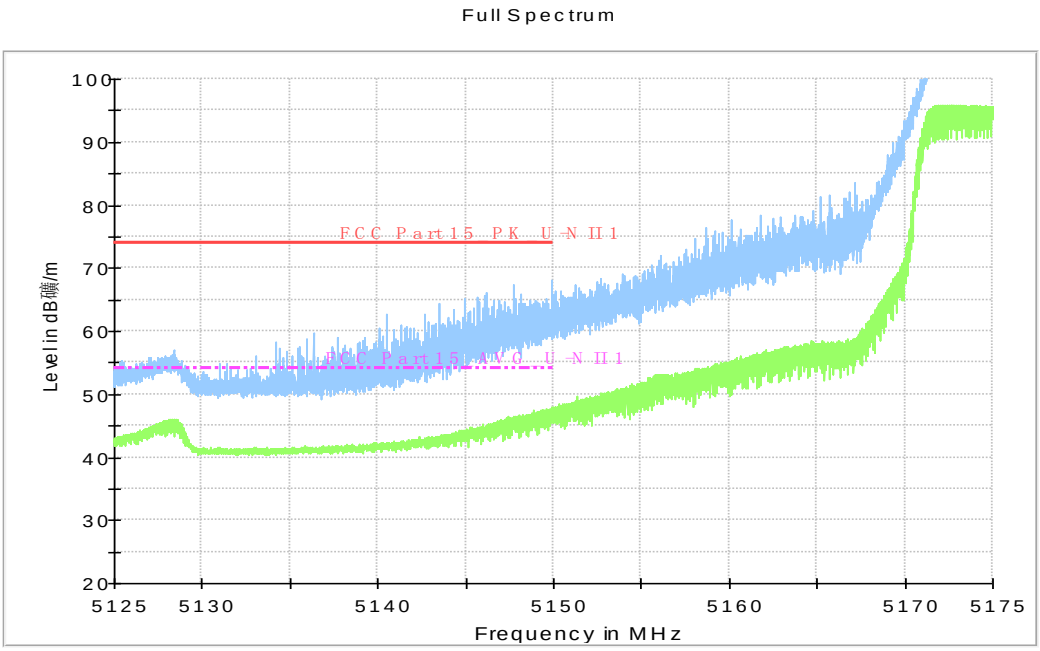


Fig. 50 Band Edges (802.11n-HT20, 5180MHz)

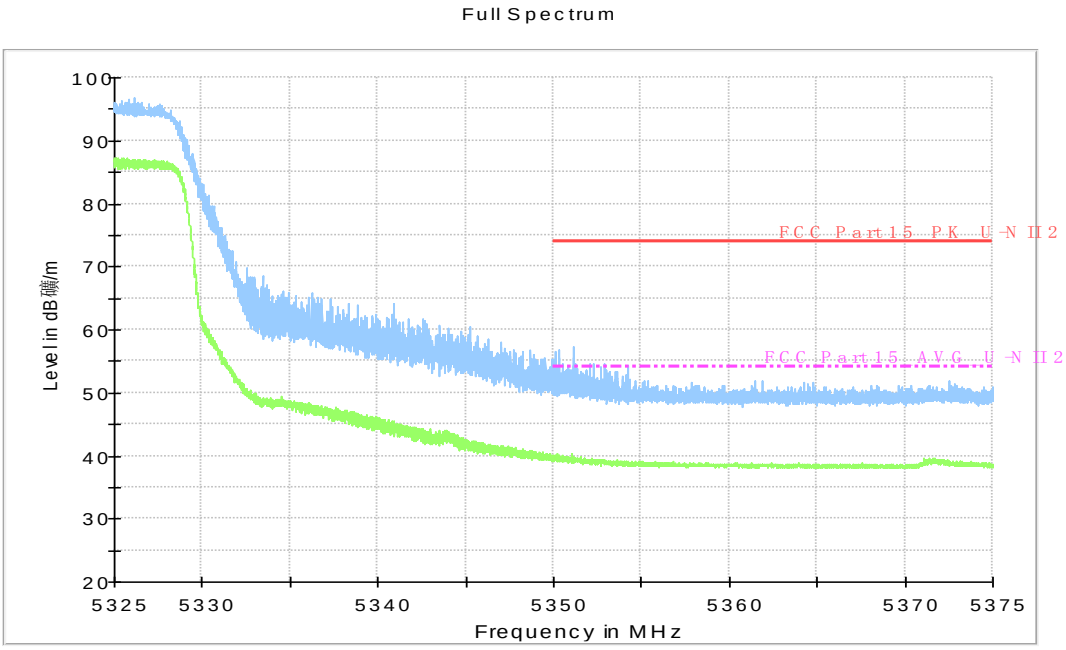


Fig. 51 Band Edges (802.11n-HT20, 5320MHz)

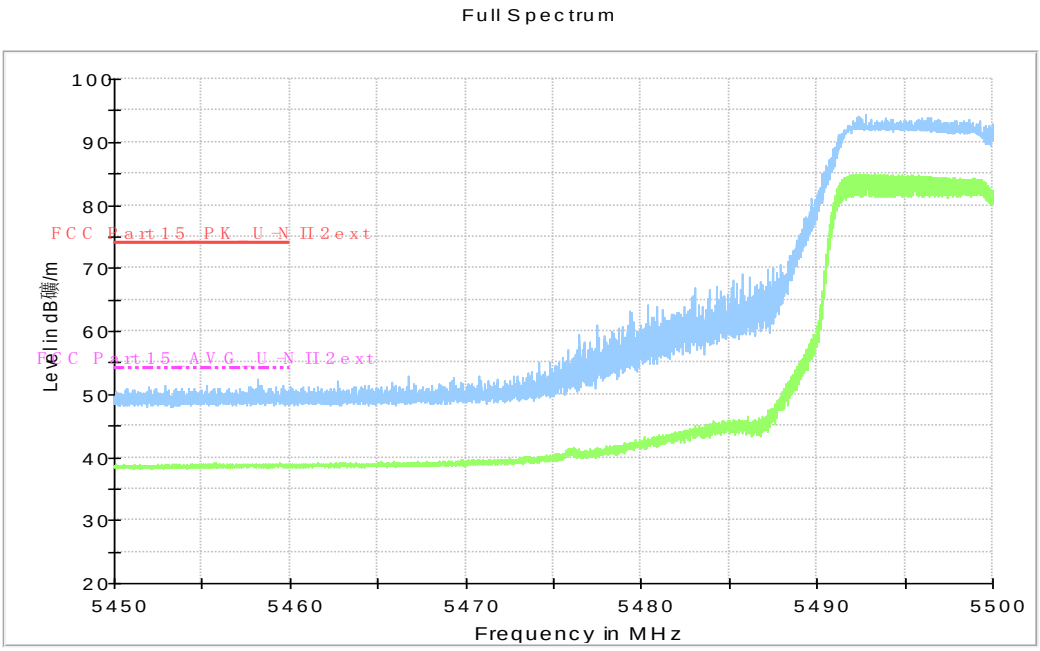


Fig. 52 Band Edges (802.11n-HT20, 5500MHz)

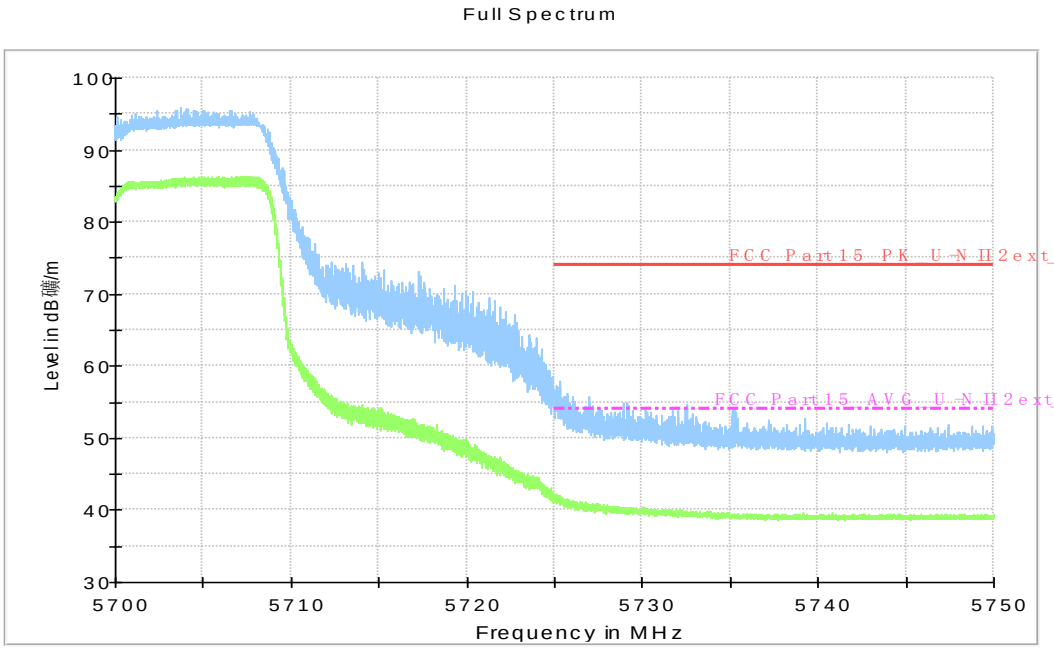


Fig. 53 Band Edges (802.11n-HT20, 5700MHz)

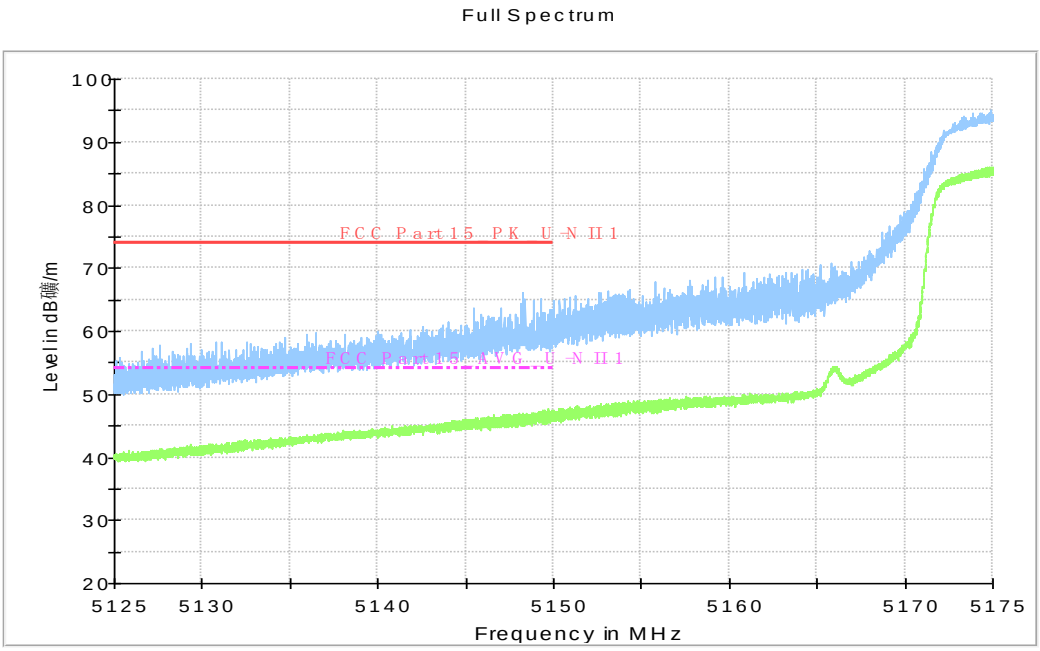


Fig. 54 Band Edges (802.11n-HT40, 5190MHz)

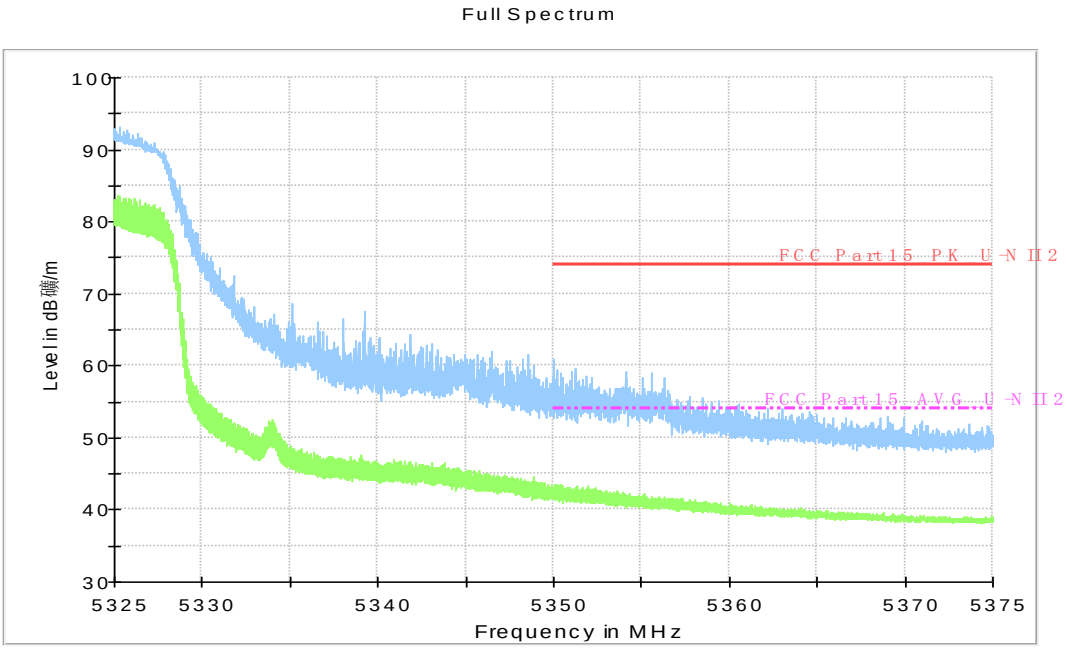


Fig. 55 Band Edges (802.11n-HT40, 5310MHz)

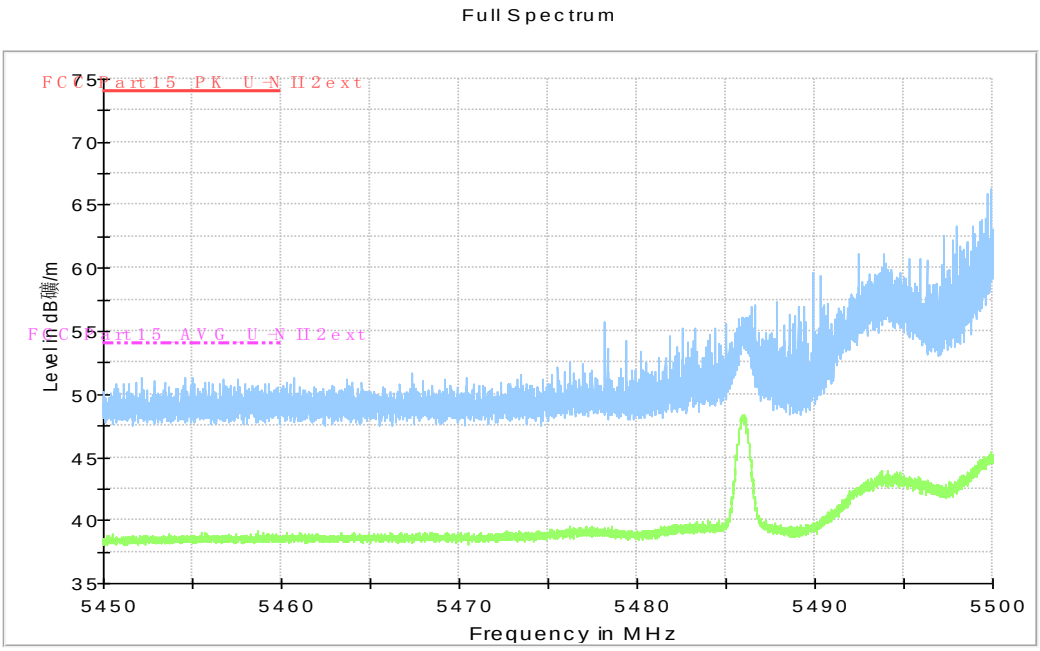


Fig. 56 Band Edges (802.11n-HT40, 5510MHz)

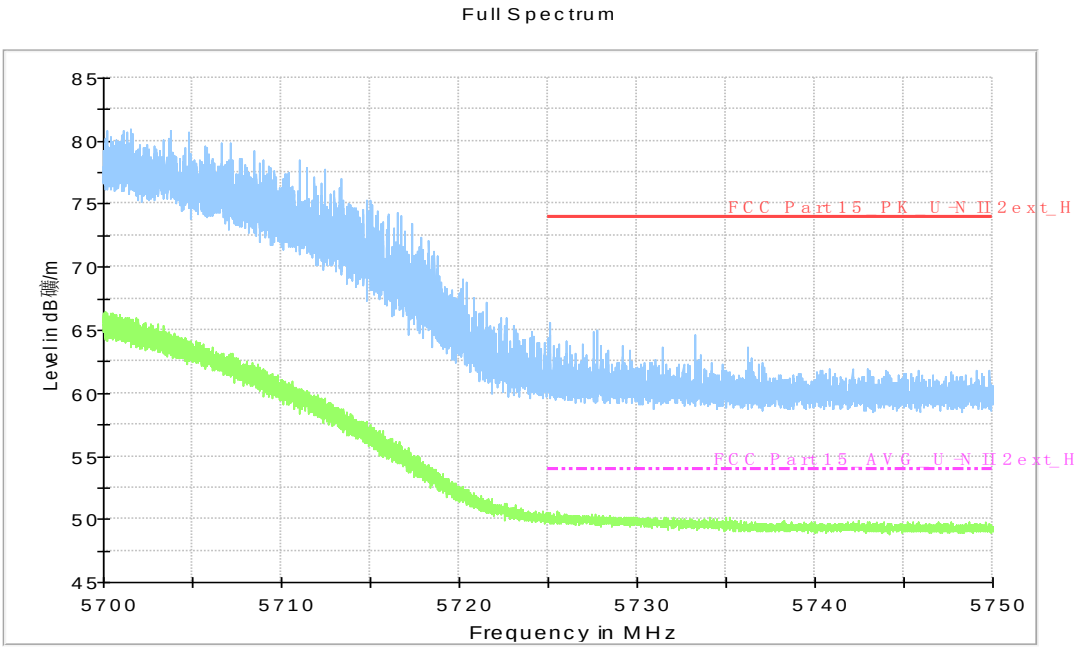


Fig. 57 Band Edges (802.11n-HT40, 5670MHz)

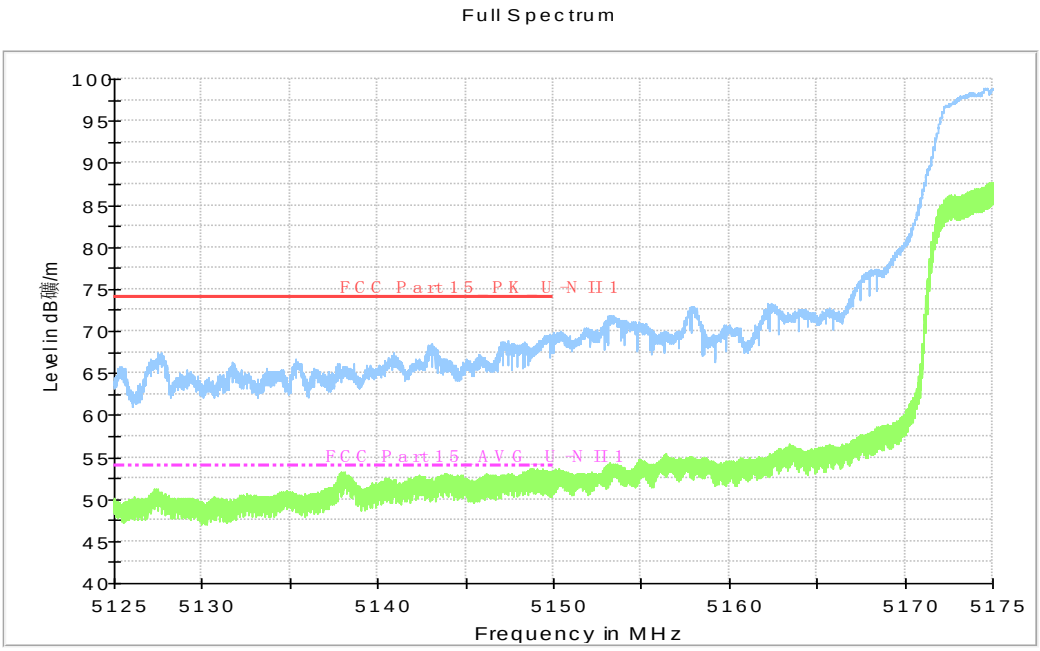


Fig. 58 Band Edges (802.11ac-HT80, 5210MHz)

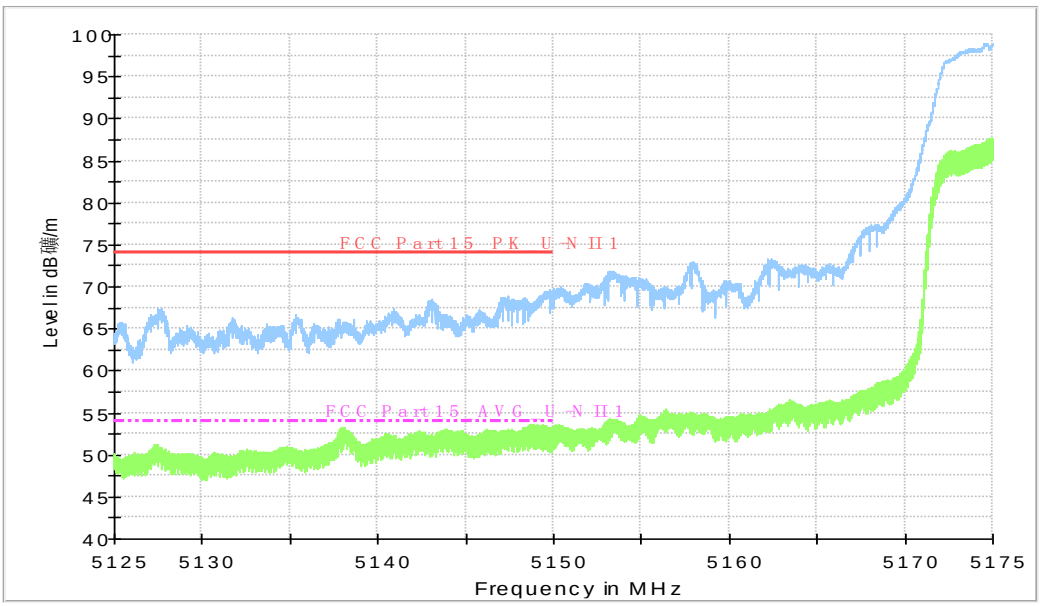


Fig. 59 Band Edges (802.11ac-HT80, 5290MHz)

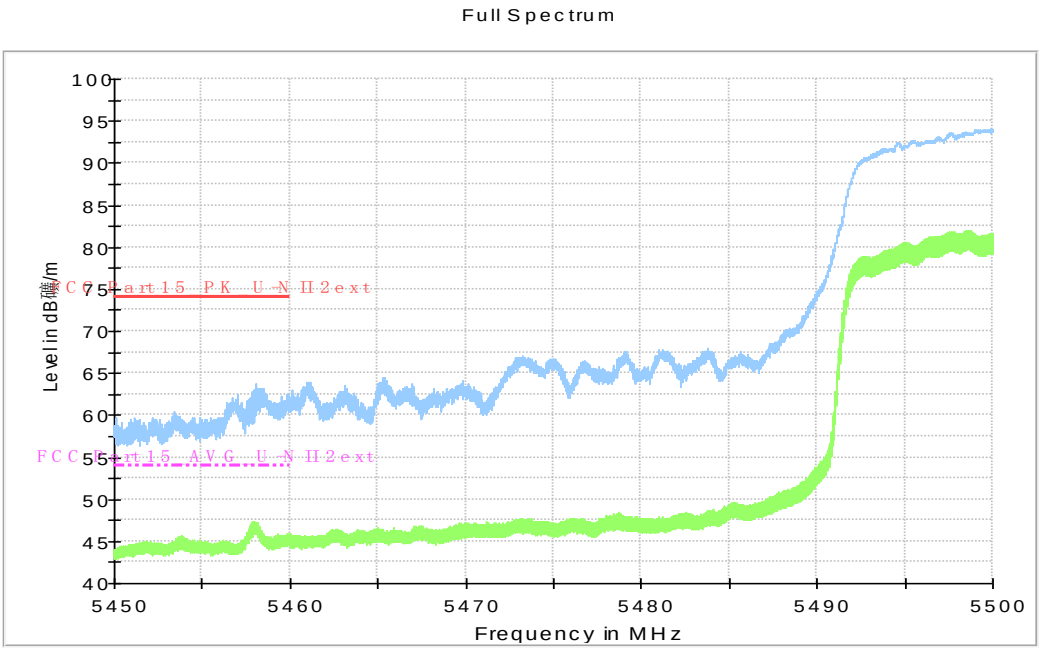


Fig. 60 Band Edges (802.11ac-HT80, 5530MHz)

A.6. Transmitter Spurious Emission

Measurement Limit:

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

The measurement is made according to KDB 789033
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(dBμV/m)	Measurement distance(m)
30-88	40.0	3
88-216	43.5	3
216-960	46.0	3
Above 960	54.0	3

Note: for frequency range below 960MHz, the limit in 15.209 is defined in 10m test distance. The limit used above is calculated from 10m to 3m

Measurement uncertainty:
Expanded measurement uncertainty for this test item is U =5.28 dB, k=2.

Measurement Results:

Conclusion: PASS

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

Average

802.11a

Channel 36

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
5149.780	48.1	-35.1	34.6	48.6	H
17923.200	45.2	-17.7	45.6	17.3	H
17930.000	45.1	-17.7	45.6	17.2	V
17919.600	45.1	-17.7	45.6	17.2	H
17917.200	45.1	-17.7	45.6	17.2	H
17933.200	45.1	-17.7	45.6	17.2	H

Channel 40

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
17935.200	45.2	-17.7	45.6	17.3	H
17920.400	45.1	-17.7	45.6	17.2	H
17928.800	45.1	-17.7	45.6	17.2	V
17913.200	45.1	-18.5	45.6	18.0	H
17932.800	45.1	-17.7	45.6	17.2	H
17936.800	45.1	-17.7	45.6	17.2	H

Channel 48

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
17932.800	45.2	-17.7	45.6	17.3	H
17931.200	45.1	-17.7	45.6	17.2	H
17933.200	45.1	-17.7	45.6	17.2	V
17920.400	45.0	-17.7	45.6	17.1	H
17934.400	44.9	-17.7	45.6	17.0	H
17940.800	44.9	-17.7	45.6	17.0	H

Channel 52

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
17936.400	45.3	-17.7	45.6	17.4	H
17937.200	45.2	-17.7	45.6	17.3	H
17926.000	45.1	-17.7	45.6	17.2	V
17944.400	45.1	-17.7	45.6	17.2	H
17935.200	45.1	-17.7	45.6	17.2	H
17924.000	45.1	-17.7	45.6	17.2	H

Channel 56

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
17925.600	45.3	-17.7	45.6	17.4	H
17932.000	45.2	-17.7	45.6	17.3	H
17914.400	45.1	-17.7	45.6	17.2	V
17933.600	45.1	-17.7	45.6	17.2	H
17925.200	45.1	-17.7	45.6	17.2	H
17921.600	45.1	-17.7	45.6	17.2	H

Channel 64

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
5350.090	39.1	-34.8	34.6	39.3	H
17929.600	45.4	-17.7	45.6	17.5	H
17928.400	45.1	-17.7	45.6	17.2	V
17930.000	45.1	-17.7	45.6	17.2	H
17924.400	45.0	-17.7	45.6	17.1	H
17916.000	45.0	-17.7	45.6	17.1	H

Channel 100

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
5457.695	38.4	-34.9	34.6	38.7	H
17916.400	45.4	-17.7	45.6	17.5	H
17928.800	45.1	-17.7	45.6	17.2	V
17924.800	45.1	-17.7	45.6	17.2	H
17941.200	45.1	-17.7	45.6	17.2	H
17938.000	45.1	-17.7	45.6	17.2	H

Channel 120

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
17935.200	45.5	-17.7	45.6	17.6	H
17926.400	45.3	-17.7	45.6	17.4	H
17927.600	45.2	-17.7	45.6	17.3	V
17926.000	45.2	-17.7	45.6	17.3	H
17940.800	45.2	-17.7	45.6	17.3	H
17928.400	45.1	-17.7	45.6	17.2	H

Channel 140

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
17930.000	45.1	-17.7	45.6	17.2	H
17925.200	45.1	-17.7	45.6	17.2	H
17922.000	45.0	-17.7	45.6	17.1	V
17939.200	45.0	-17.7	45.6	17.1	H
17928.000	45.0	-17.7	45.6	17.1	H
17921.600	45.0	-17.7	45.6	17.1	H

802.11n-HT20

Channel 36

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
5149.925	48.0	-35.1	34.6	48.5	H
17936.400	45.1	-17.7	45.6	17.2	H
17927.200	45.0	-17.7	45.6	17.1	V
17915.600	45.0	-17.7	45.6	17.1	H
17922.800	45.0	-17.7	45.6	17.1	H
17934.800	45.0	-17.7	45.6	17.1	H

Channel 40

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
17942.800	45.3	-17.7	45.6	17.4	H
17933.200	45.3	-17.7	45.6	17.4	H
17923.600	45.1	-17.7	45.6	17.2	V
17931.200	45.1	-17.7	45.6	17.2	H
17928.800	45	-17.7	45.6	17.1	H
17934.400	45	-17.7	45.6	17.1	H

Channel 48

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
17942.800	45.3	-17.7	45.6	17.4	H
17933.200	45.3	-17.7	45.6	17.4	H
17923.600	45.1	-17.7	45.6	17.2	V
17931.200	45.1	-17.7	45.6	17.2	H
17928.800	45.0	-17.7	45.6	17.1	H
17934.400	45.0	-17.7	45.6	17.1	H

Channel 52

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
17930.800	45.3	-17.7	45.6	17.4	H
17915.200	45.2	-17.7	45.6	17.3	H
17927.600	45.2	-17.7	45.6	17.3	V
17930.400	45.1	-17.7	45.6	17.2	H
17918.400	45.1	-17.7	45.6	17.2	H
17929.200	45.1	-17.7	45.6	17.2	H

Channel 56

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
17932.800	45.0	-17.7	45.6	17.1	H
17932.000	45.0	-17.7	45.6	17.1	H
17931.200	45.0	-17.7	45.6	17.1	V
17928.000	45.0	-17.7	45.6	17.1	H
17916.800	45.0	-17.7	45.6	17.1	H
17933.600	44.9	-17.7	45.6	17.0	H

Channel 64

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
5351.145	39.3	-34.8	34.6	39.5	H
17923.600	45.2	-17.7	45.6	17.3	H
17933.200	45.2	-17.7	45.6	17.3	V
17924.800	45.1	-17.7	45.6	17.2	H
17932.400	45.1	-17.7	45.6	17.2	H
17932.800	45.0	-17.7	45.6	17.1	H

Channel 100

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
5458.290	41.9	-34.9	34.6	38.6	H
17909.600	45.1	-18.5	45.6	18.0	H
17935.200	45.1	-17.7	45.6	17.2	V
17940.000	45.0	-17.7	45.6	17.1	H
17923.200	45.0	-17.7	45.6	17.1	H
17919.600	45.0	-17.7	45.6	17.1	H

Channel 120

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
17916.000	45.1	-17.7	45.6	17.200	H
17930.400	45.1	-17.7	45.6	17.200	H
17918.000	45.1	-17.7	45.6	17.200	V
17925.200	45.0	-17.7	45.6	17.100	H
17925.600	45.0	-17.7	45.6	17.100	H
17913.600	45.0	-18.5	45.6	17.900	H

Channel 140

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
5725.315	41.9	-33.8	35.1	40.600	H
17922.000	45.0	-17.7	45.6	17.100	H
17935.200	44.9	-17.7	45.6	17.000	V
17926.000	44.9	-17.7	45.6	17.000	H
17918.800	44.9	-17.7	45.6	17.000	H
17933.200	44.9	-17.7	45.6	17.000	H

802.11n-HT40

Channel 38

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
5149.990	46.5	-35.1	34.6	47.0	H
17928.400	45.2	-17.7	45.6	17.3	H
17936.800	45.0	-17.7	45.6	17.1	V
17928.000	45.0	-17.7	45.6	17.1	H
17927.600	45.0	-17.7	45.6	17.1	H
17937.600	45.0	-17.7	45.6	17.1	H

Channel 46

Frequency(MHz)	Result (dBuV/m)	Cable Loss	Antenna Factor	P_{Mea} (dBuV/m)	Polarization
17921.200	45.2	-17.7	45.6	17.3	H
17926.400	45.0	-17.7	45.6	17.1	H
17929.600	45.0	-17.7	45.6	17.1	V
17938.400	45.0	-17.7	45.6	17.1	H
17933.200	44.9	-17.7	45.6	17.0	H
17926.800	44.9	-17.7	45.6	17.0	H