



FCC PART 15C TEST REPORT No.I20Z61861-IOT13

for

Hoyos Integrity Corporation

smart phone

H1U

With

FCC ID: 2AXQJH1U

Hardware Version: V1.2

Software Version: P612BNV03.12.10

Issued Date: 2020-12-23

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.

Test Laboratory:

CTTL-Telecommunication Technology Labs, CAICT

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

Tel:+86(0)10-62304633-2512, Fax:+86(0)10-62304633-2504

Email: ctl_terminals@caict.ac.cn, website: www.caict.ac.cn



REPORT HISTORY

Report Number	Revision	Description	Issue Date
I20Z61861-IOT13	Rev.0	1st edition	2020-12-23

CONTENTS

CONTENTS	3
1. TEST LATORATORY.....	5
1.1. INTRODUCTION & ACCREDITATION	5
1.2. TESTING LOCATION	5
1.3. TESTING ENVIRONMENT	5
1.4. PROJECT DATE	5
1.5. SIGNATURE	5
2. CLIENT INFORMATION.....	6
2.1. APPLICANT INFORMATION	6
2.2. MANUFACTURER INFORMATION	6
3. EQUIPMENT UNDER TEST (EUT) AND ANCILLARY EQUIPMENT(AE)	7
3.1. ABOUT EUT	7
3.2. INTERNAL IDENTIFICATION OF EUT USED DURING THE TEST	7
3.3. INTERNAL IDENTIFICATION OF AE USED DURING THE TEST	7
3.4. GENERAL DESCRIPTION.....	8
4. REFERENCE DOCUMENTS	8
4.1. DOCUMENTS SUPPLIED BY APPLICANT	8
4.2. REFERENCE DOCUMENTS FOR TESTING.....	8
5. LABORATORY ENVIRONMENT.....	8
6. SUMMARY OF TEST RESULTS	9
6.1. SUMMARY OF TEST RESULTS	9
6.2. STATEMENTS.....	9
6.3. TEST CONDITIONS	9
7. TEST EQUIPMENTS UTILIZED	10
8. MEASUREMENT UNCERTAINTY	11
8.1. TRANSMITTER OUTPUT POWER	11
8.2. PEAK POWER SPECTRAL DENSITY	11
8.3. OCCUPIED 6DB BANDWIDTH.....	11
8.4. BAND EDGES COMPLIANCE	11
8.5. SPURIOUS EMISSIONS	11
8.6. AC POWER-LINE CONDUCTED EMISSION	11
ANNEX A: EUT PARAMETERS.....	11
ANNEX B: MEASUREMENT RESULTS.....	12
B.1. MEASUREMENT METHOD	12
B.2. MAXIMUM PEAK OUTPUT POWER	13

B.2.1 ANTENNA GAIN.....	13
B.2.2. MAXIMUM AVERAGE OUTPUT POWER-CONDUCTED	13
B.3. PEAK POWER SPECTRAL DENSITY	15
B.4. OCCUPIED 6DB BANDWIDTH	16
B.5. TRANSMITTER SPURIOUS EMISSION.....	24
B.5.1 TRANSMITTER SPURIOUS EMISSION - RADIATED	24
B.6. BAND EDGES COMPLIANCE	35
B.6.1 BAND EDGES - RADIATED	35
FIG. 15 BAND EDGES (802.11A, 5745MHZ)	36
FIG. 16 BAND EDGES (802.11A, 5825MHZ)	36
FIG. 17 BAND EDGES (802.11N-HT20, 5745MHZ).....	37
FIG. 18 BAND EDGES (802.11N-HT20, 5825MHZ).....	37
FIG. 19 BAND EDGES (802.11AC-HT20, 5745MHZ).....	38
FIG. 20 BAND EDGES (802.11AC-HT20, 5825MHZ).....	38
FIG. 21 BAND EDGES (802.11N-HT40, 5755MHZ).....	39
FIG. 22 BAND EDGES (802.11N-HT40, 5795MHZ).....	39
FIG. 23 BAND EDGES (802.11AC-HT40, 5755MHZ).....	40
FIG. 24 BAND EDGES (802.11AC-HT40, 5795MHZ).....	40
FIG. 25 BAND EDGES (802.11AC-HT80, 5775MHZ).....	41
FIG. 26 BAND EDGES (802.11AC-HT80, 5775MHZ).....	41
B.7. AC POWERLINE CONDUCTED EMISSION	42
FIG. 27	42
FIG. 28	42
FIG. 27 AC POWERLINE CONDUCTED EMISSION-802.11A	43
FIG. 28 AC POWERLINE CONDUCTED EMISSION-IDLE.....	44
ANNEX C: ACCREDITATION CERTIFICATE	45

1. TEST LABORATORY

1.1. Introduction & Accreditation

Telecommunication Technology Labs, CAICT is an ISO/IEC 17025:2005 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 (CN0066). The detail accreditation scope can be found on NVLAP website.

1.2. Testing Location

Conducted testing Location: CTTL(Gaolizhang Road)

Address: Cuihu Cloud Center, No.1, Gaolizhang Road, Wenquan,
Haidian District, Beijing, China

Radiated testing Location: CTTL(huayuan North Road)

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

1.3. Testing Environment

Normal Temperature: 15-35°C

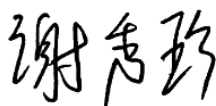
Relative Humidity: 20-75%

1.4. Project date

Testing Start Date: 2020-10-28

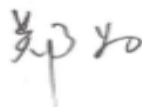
Testing End Date: 2020-12-23

1.5. Signature



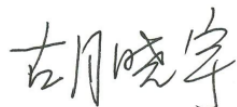
Xie Xiuzhen

(Prepared this test report)



Zheng Wei

(Reviewed this test report)



Hu Xiaoyu

(Approved this test report)



2. CLIENT INFORMATION

2.1. Applicant Information

Company Name: Hoyos Integrity Corporation
Address: 1975 E. Sunrise Blvd, Suite 400, Fort Lauderdale, Florida, USA
City: /
Postal Code: /
Country: USA
Telephone: 9546008131
Fax: 8557488051

2.2. Manufacturer Information

Company Name: Hoyos Integrity Corporation
Address: 1975 E. Sunrise Blvd, Suite 400, Fort Lauderdale, Florida, USA
City: /
Postal Code: /
Country: USA
Telephone: 9546008131
Fax: 8557488051

3. EQUIPMENT UNDER TEST (EUT) AND ANCILLARY

EQUIPMENT(AE)

3.1. About EUT

Description	smart phone
Model name	H1U
FCC ID	2AXQJH1U
WLAN Frequency Band	ISM Band: 5725MHz~5850MHz
Type of modulation	OFDM
Voltage	3.85V

3.2. Internal Identification of EUT used during the test

EUT ID*	IMEI	HW Version	SW Version
EUT1	350311290000777/ 350311290003417	V1.2	P612BNV03.12.10
EUT2	350311290001320/ 350311290003961	V1.2	P612BNV03.12.10

*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

AE1	Charger
AE2	USB Cable
AE4	Battery

AE1

Model	LX150331R
Manufacturer	Shenzhen Kosun Industrial Co.,Ltd
Length of cable	/

AE2

Model	STN-A114A
Manufacturer	Saibao (jiangxi) Communication Industrial Co., Ltd
Length of cable	/

AE4

Model	/
Manufacturer	Ningbo Veken Battery Co., Ltd.
Capacitance	3900mAh
Nominal voltage	3.85v

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

3.4. General Description

Equipment Under Test (EUT) is a model of smart phone with integrated antenna. It consists of normal options: Battery and Charger.

Manual and specifications of the EUT were provided to fulfil the test.

Samples undergoing test were selected by the Client.

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	FCC CFR 47, Part 15, Subpart C and E: 15.205 Restricted bands of operation; 15.209 Radiated emission limits, general requirements; 15.407 General technical requirements	2018
ANSI C63.10	Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz	2013
UNII: KDB 789033 D02	General U-NII Test Procedures New Rules v02r01	2017-12
KDB 558074 D01	Federal Communications Commission Office of Engineering and Technology Laboratory Division GUIDANCE FOR COMPLIANCE MEASUREMENTS ON DIGITAL TRANSMISSION SYSTEM, FREQUENCY HOPPING SPREAD SPECTRUM SYSTEM, AND HYBRID SYSTEM DEVICES OPERATING UNDER SECTION 15.247 OF THE FCC RULES	2019

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 Part15C	Sub-clause of IC	Verdict
Maximum Peak Output Power	15.407 (a)	/	P
Peak Power Spectral Density	15.407 (a)	/	P
Occupied 6dB Bandwidth	15.407 (e)	/	P
Band Edges Compliance - Conducted& Radiated	15.407 (b)	/	P
Transmitter Spurious Emission - Conducted	15.407	/	P
Transmitter Spurious Emission - Radiated	15.407, 15.205, 15.209	/	P
AC Powerline Conducted Emission	15.107, 15.207	/	P

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/matrix manufacturer as listed in section 6.1 of this report for the EUT specified in section 3 according to the standards or reference documents listed in section 4.1.

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

6.3. Test Conditions

For this report, all the test cases are tested under normal temperature and normal voltage, and also under norm humidity, the specific condition is shown as follows:

Temperature	26°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	2021-05-06
2	LISN	ENV216	101200	Rohde & Schwarz	1 year	2021-05-19
3	Test Receiver	ESCI	100344	Rohde & Schwarz	1 year	2021-02-26
4	Shielding Room	S81	WL-SB-1005054	Beijing Lingkun Electromagnetic Technology Co. LTD	/	/
5	Attenuator	10dB/2W	/	Rosenberger	/	/

Radiated emission test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Period	Calibration Due date
1	Test Receiver	ESU26	100235	Rohde & Schwarz	1 year	2021-03-03
2	BiLog Antenna	VULB9163	9163-1223	Schwarzbeck	1 year	2021-03-18
3	Dual-Ridge Waveguide Horn Antenna	3115	6914	ETS-Lindgren	1 year	2021-01-14

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 6dB 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	/
$30\text{MHz} \leq f \leq 1\text{GHz}$	4.86
$1\text{GHz} \leq f \leq 18\text{GHz}$	5.26
$18\text{GHz} \leq f \leq 40\text{GHz}$	5.28

8.6. AC Power-line Conducted Emission

Measurement Uncertainty : 3.38dB,k=2

ANNEX A: EUT parameters

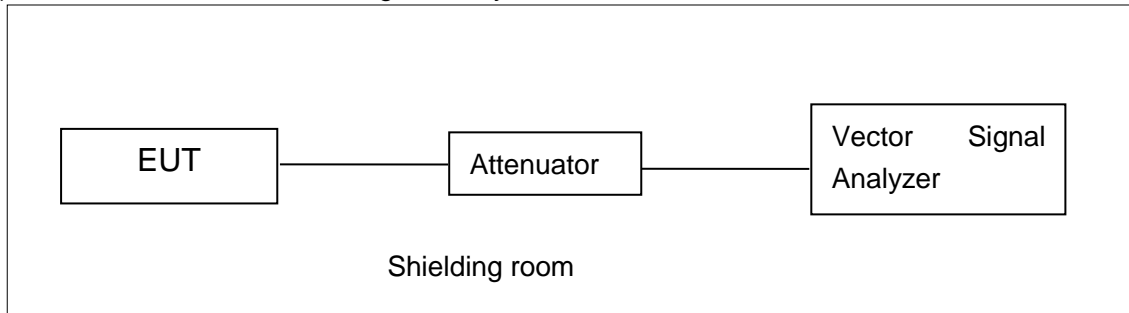
Disclaimer: the power worse case and antenna gain provided by the client may affect the validity of the measurement results in this report, and the client shall bear the impact and consequences arising therefrom.

ANNEX B: MEASUREMENT RESULTS

B.1. Measurement Method

B.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

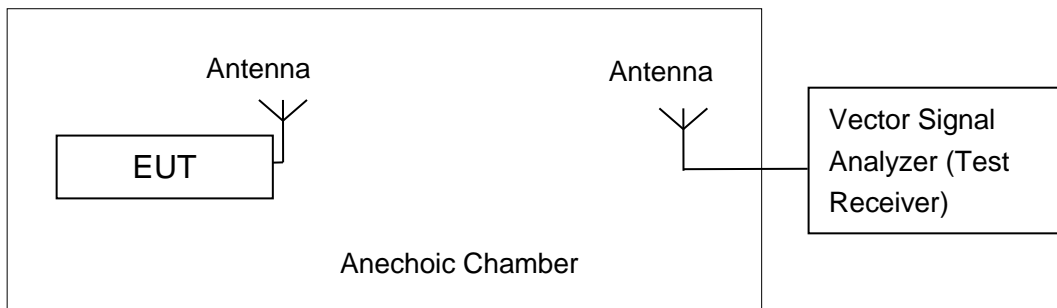


B.1.2. Radiated Emission Measurements

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 ANSI C63.10.

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.

B.2. Maximum Peak Output Power

Measurement Limit and Method:

Standard	Limit (dBm)
FCC CRF Part 15.407(a)	< 30

The following data rates are selected as the worst condition; as the maximum power is got with these data rate. The following cases are performed with this condition.

802.11a mode	802.11n-HT20 mode	802.11n-HT40 mode	802.11ac-HT20 mode	802.11ac-HT40 mode	802.11ac-HT80 mode
6Mbps	MCS0	MCS0	MCS0	MCS0	MCS0

Duty Cycle

Mode	802.11a	802.11n-HT20	802.11ac-HT20	802.11n-HT40	802.11ac-HT40	802.11ac-HT80
Duty Cycle	96%	97%	97%	94%	94%	89%

B.2.1 Antenna Gain

Antenna gain is -2.0dBi and the value is supplied by the applicant or manufacturer.

B.2.2. Maximum Average Output Power-Conducted

Method of Measurement: See ANSI C63.10-clause 12.3.2.2 Method SA-1

802.11a mode

Mode	Test Result (dBm)		
	5745MHz (Ch149)	5785MHz (Ch157)	5825MHz (Ch165)
802.11a	15.71	15.86	16.06

802.11n-HT20 mode

Mode	Test Result (dBm)		
	5745MHz (Ch149)	5785MHz (Ch157)	5825MHz(Ch165)
802.11n(20MHz)	15.61	15.73	15.85

802.11ac-HT20 mode

Mode	Test Result (dBm)		
	5745MHz (Ch149)	5785MHz (Ch157)	5825MHz(Ch165)
802.11ac(20MHz)	16.20	16.07	16.00

802.11n-HT40 mode

Mode	Test Result (dBm)	
	5755MHz (Ch151)	5795MHz(Ch159)
802.11n(40MHz)	14.42	14.54

802.11ac-HT40 mode

Mode	Test Result (dBm)	
	5755MHz (Ch151)	5795MHz(Ch159)
802.11ac(40MHz)	14.39	14.35

802.11ac-HT80 mode

Mode	Test Result (dBm)
	5775MHz (Ch155)
802.11ac(80MHz)	15.61

Conclusion: PASS

B.3. Peak Power Spectral Density

Measurement Limit:

Standard	Limit
FCC 47 CFR Part 15.407(a)	< 30 dBm/500 kHz

The measurement is made according to ANSI C63.10 and KDB789033 D02

Measurement Uncertainty:

Measurement Uncertainty	0.75dB
-------------------------	--------

Measurement Results:

Mode	Channel	Power Spectral Density (dBm/500kHz)	Conclusion
802.11a	149	2.97	P
	157	3.15	P
	165	3.12	P
802.11n HT20	149	2.87	P
	157	2.72	P
	165	2.81	P
802.11ac HT20	149	2.67	P
	157	2.91	P
	165	2.80	P
802.11n HT40	151	-1.44	P
	159	-1.35	P
802.11ac HT40	151	-1.48	P
	159	-1.35	P
802.11ac HT80	155	-3.63	P

Conclusion: PASS

B.4. Occupied 6dB Bandwidth

Measurement Limit:

Standard	Limit (kHz)
FCC 47 CFR Part 15.407 (e)	≥ 500

The measurement is made according to KDB789033 D02 .

Measurement Uncertainty:

Measurement Uncertainty	60.80Hz
-------------------------	---------

Measurement Result:

Mode	Channel	Occupied 6dB Bandwidth (MHz)		conclusion
		Fig.	Value	
802.11a	149	Fig.1	16.30	P
	157	Fig.2	16.30	P
	165	Fig.3	16.30	P
802.11n HT20	149	Fig.4	17.60	P
	157	Fig.5	17.50	P
	165	Fig.6	17.55	P
802.11ac HT20	149	Fig.7	17.50	P
	157	Fig.8	17.55	P
	165	Fig.9	17.55	P
802.11n HT40	151	Fig.10	35.68	P
	159	Fig.11	36.00	P
802.11ac HT40	151	Fig.12	35.84	P
	159	Fig.13	35.84	P
802.11ac HT80	155	Fig.14	76.32	P

Conclusion: PASS

Test graphs as below:

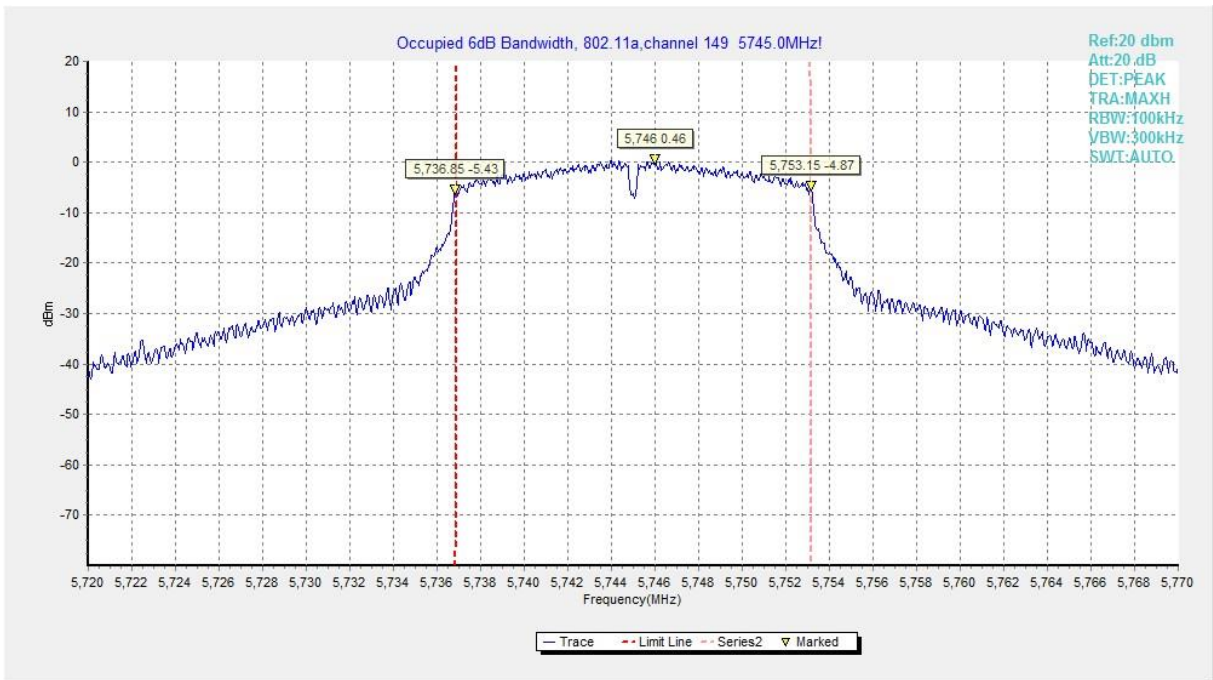


Fig. 1 Occupied 6dB Bandwidth (802.11a, Ch 149)

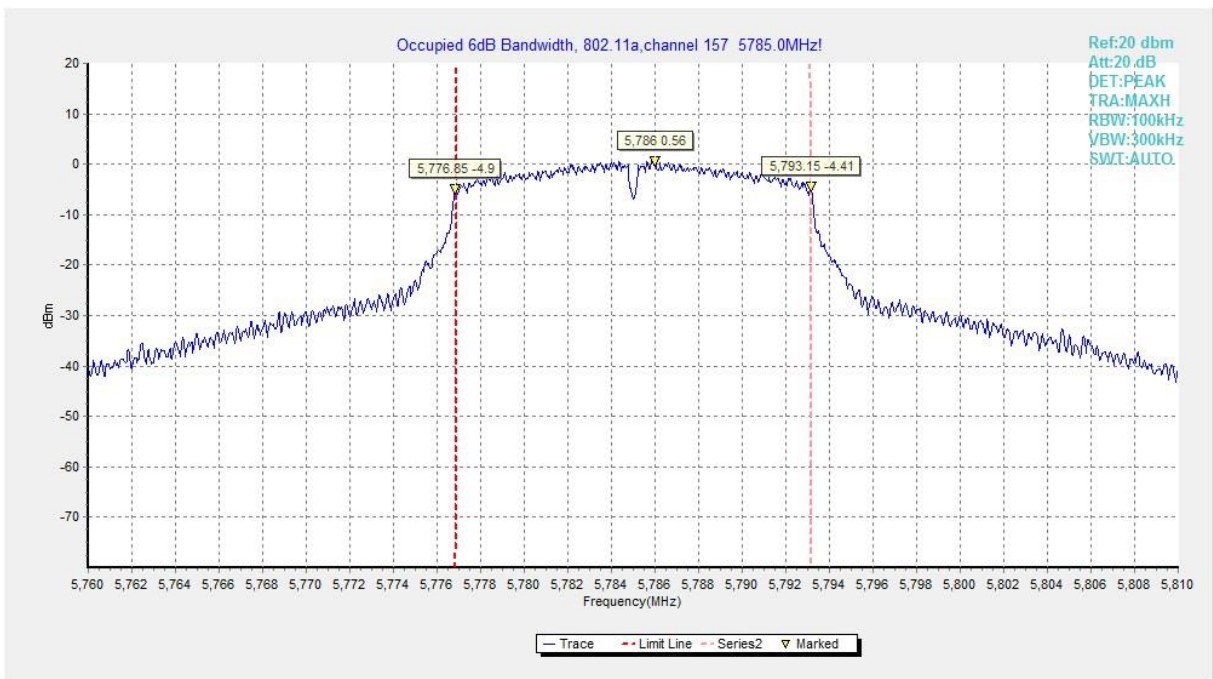


Fig. 2 Occupied 6dB Bandwidth (802.11a, Ch 157)

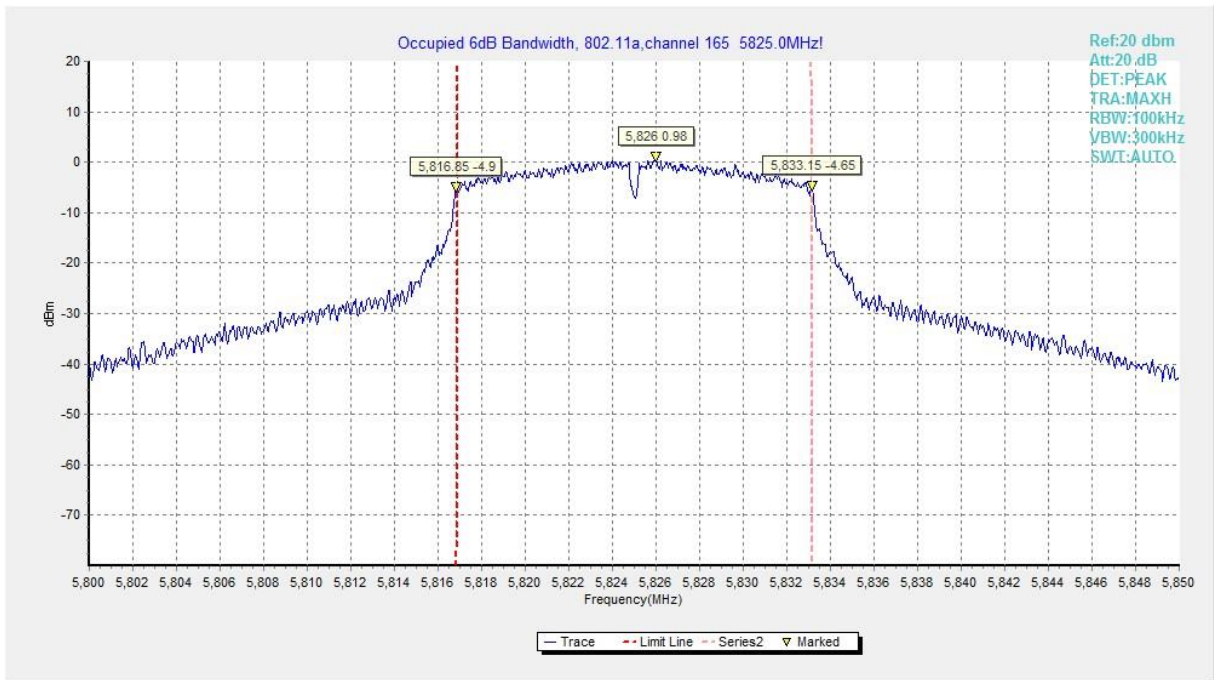


Fig. 3 Occupied 6dB Bandwidth (802.11a, Ch 165)

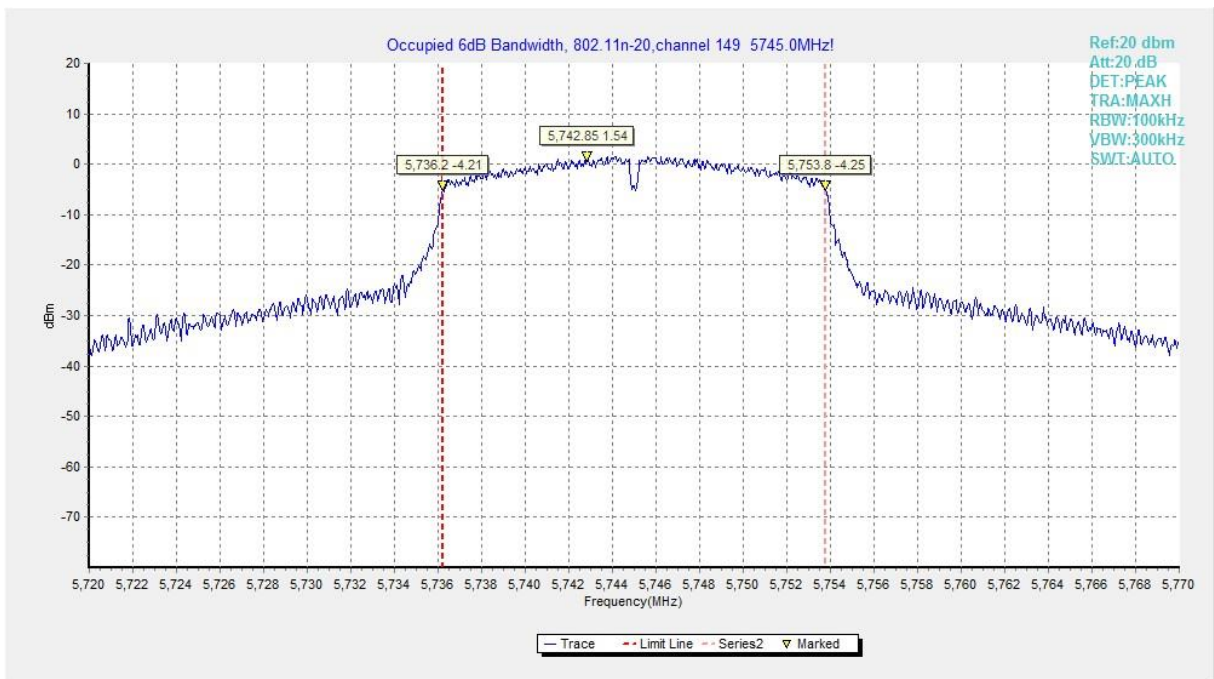


Fig. 4 Occupied 6dB Bandwidth (802.11n-HT20, Ch 149)

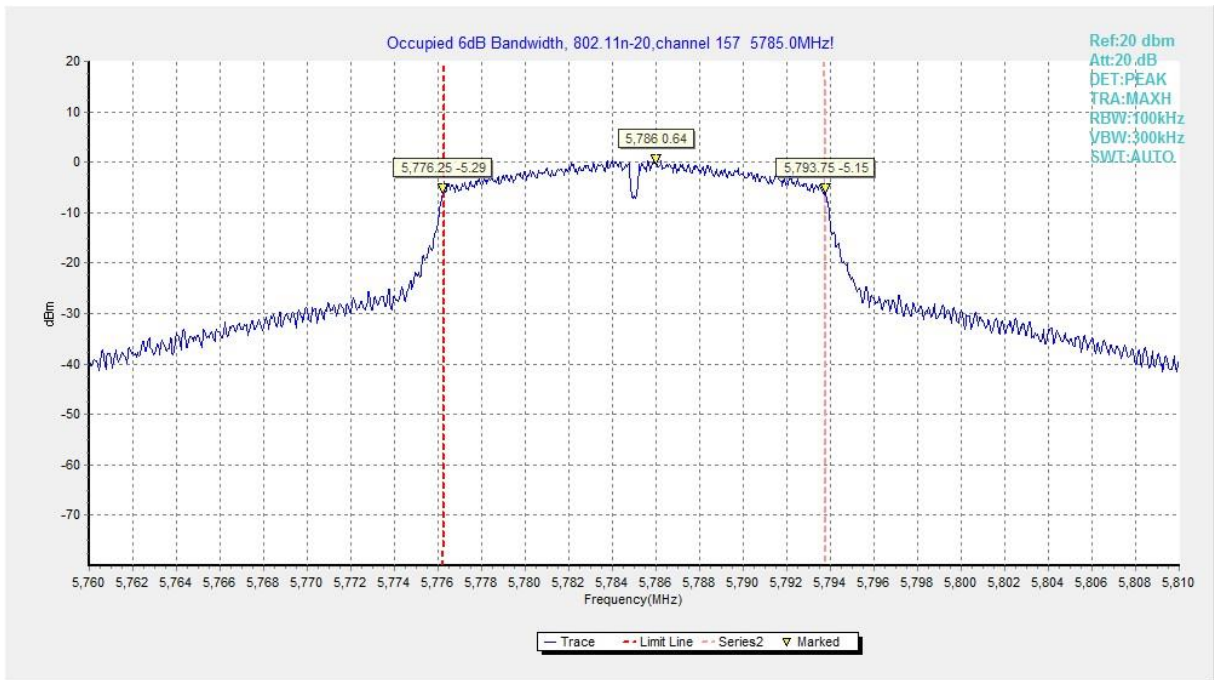


Fig. 5 Occupied 6dB Bandwidth (802.11n-HT20, Ch 157)

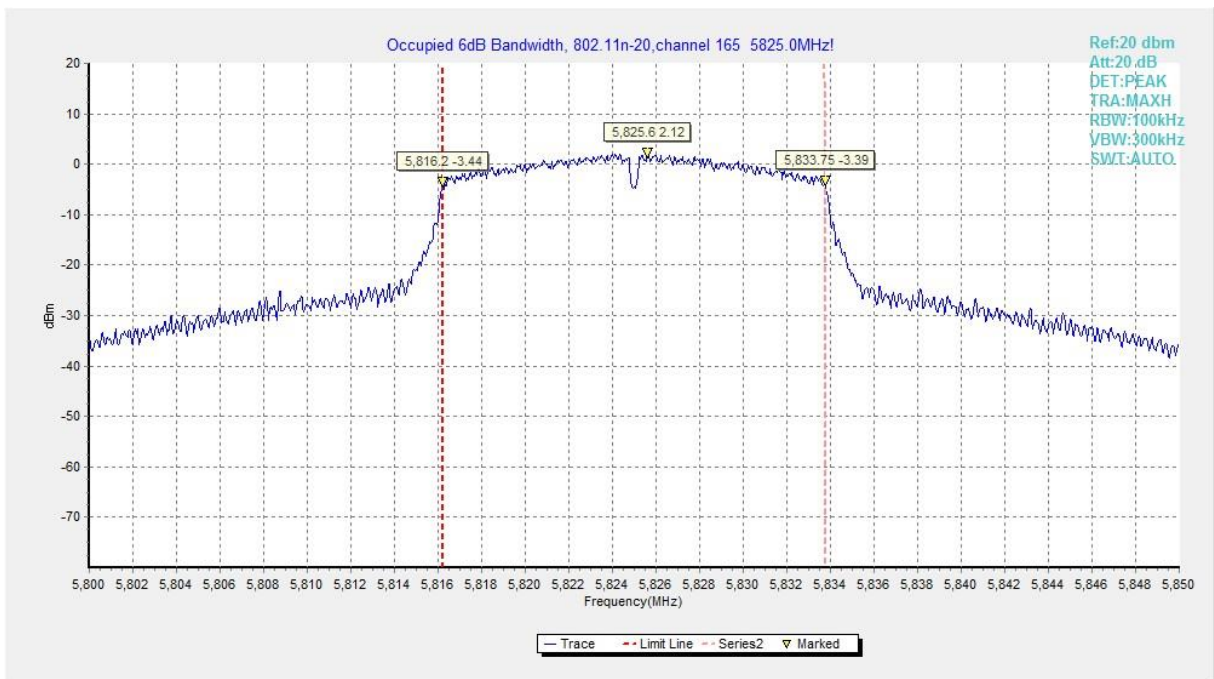


Fig. 6 Occupied 6dB Bandwidth (802.11n-HT20, Ch 165)

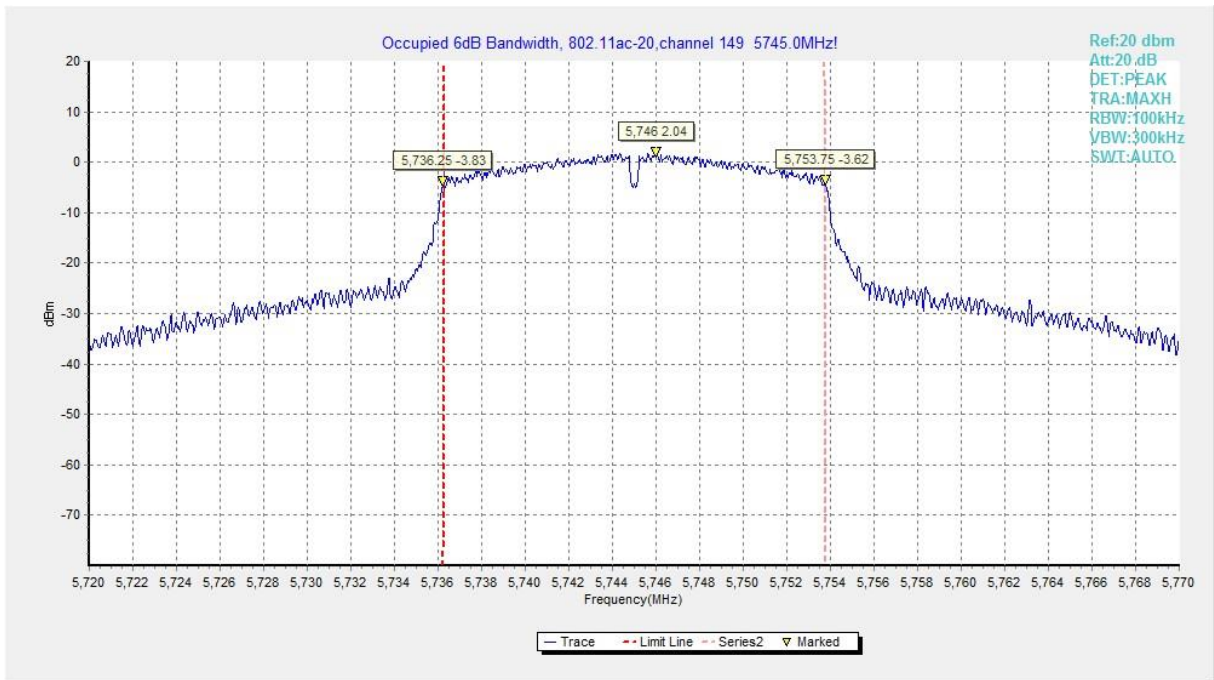


Fig. 7 Occupied 6dB Bandwidth (802.11ac-HT20, Ch 149)

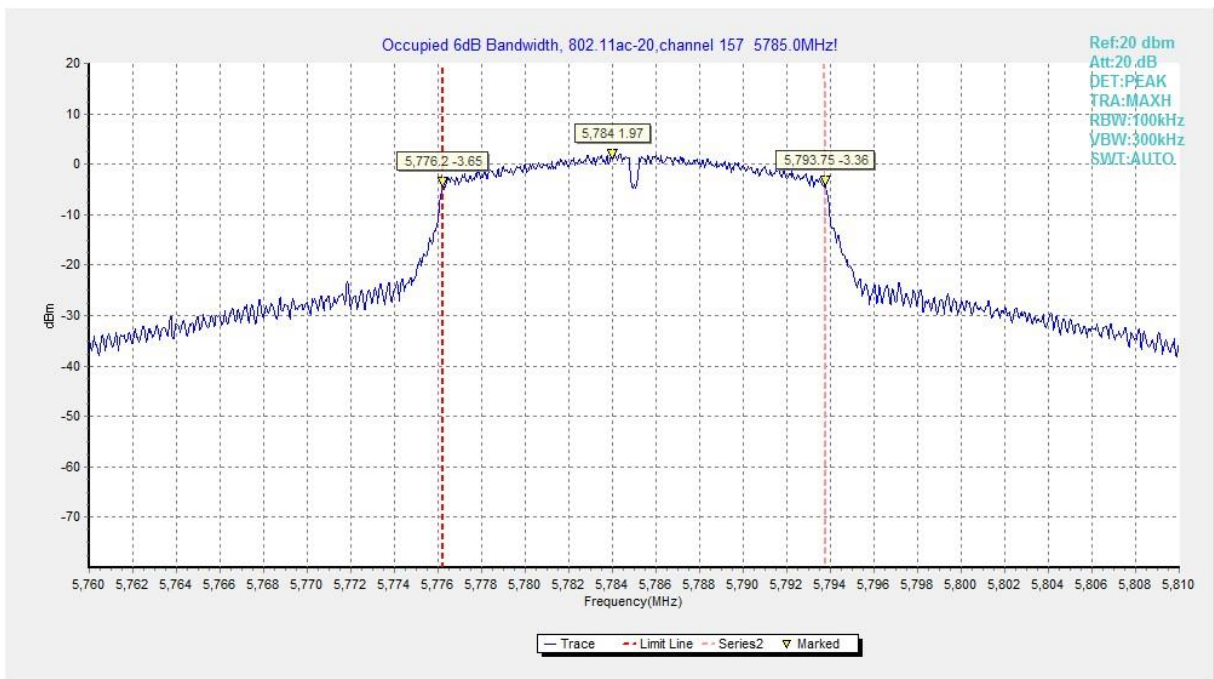


Fig. 8 Occupied 6dB Bandwidth (802.11ac-HT20, Ch 157)

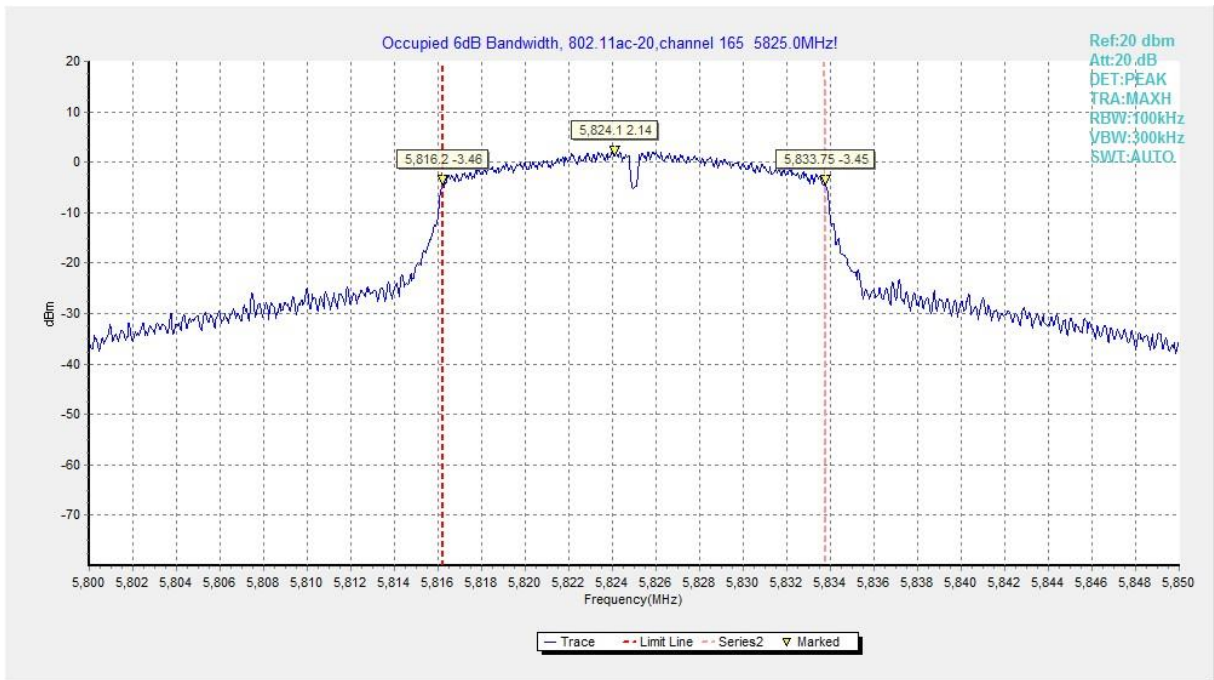


Fig. 9 Occupied 6dB Bandwidth (802.11ac-HT20, Ch 165)

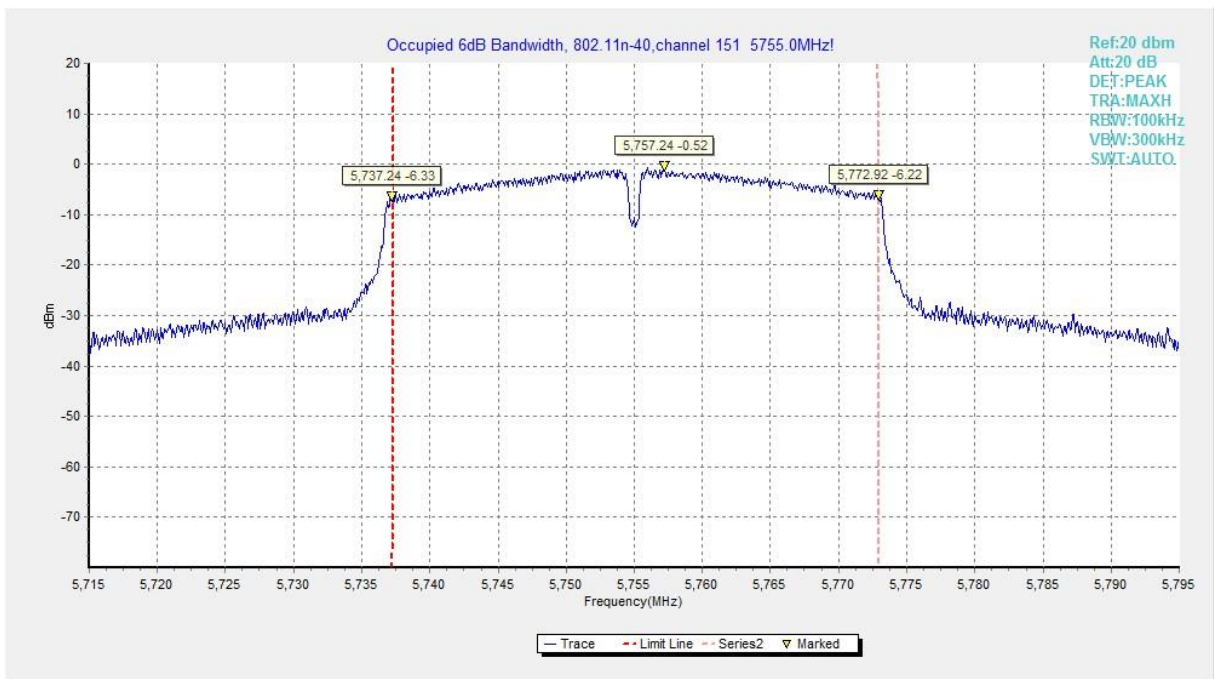


Fig. 10 Occupied 6dB Bandwidth (802.11n-HT40, Ch 151)

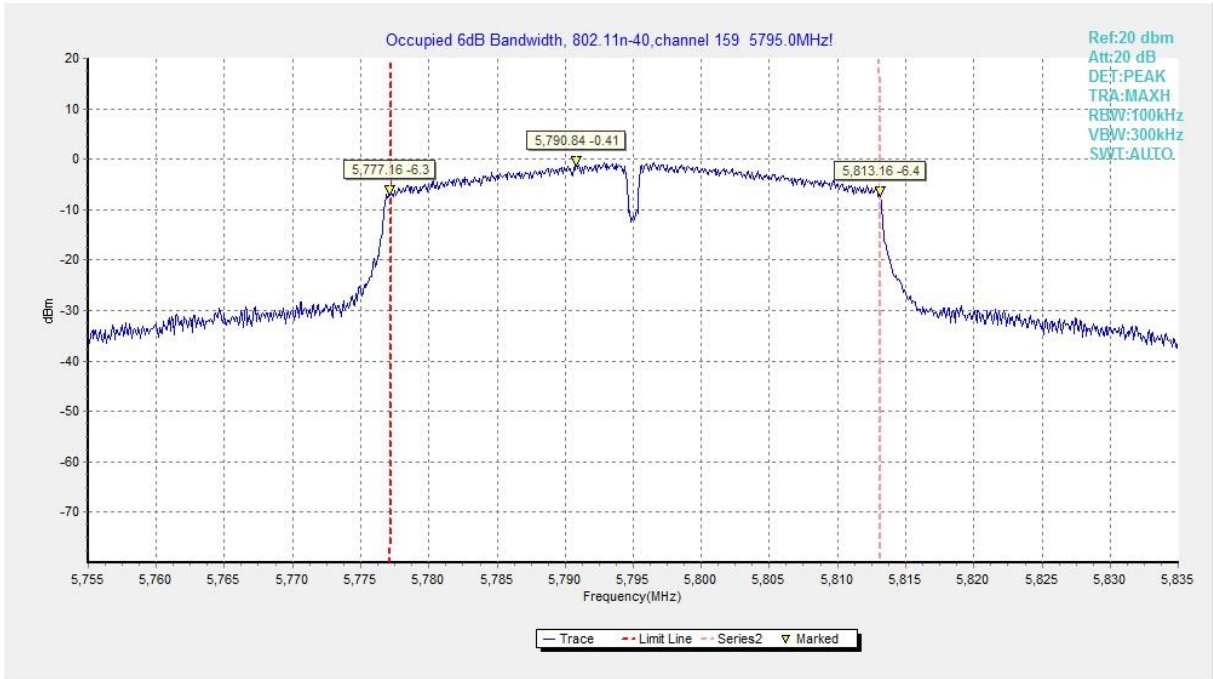


Fig. 11 Occupied 6dB Bandwidth (802.11n-HT40, Ch 159)

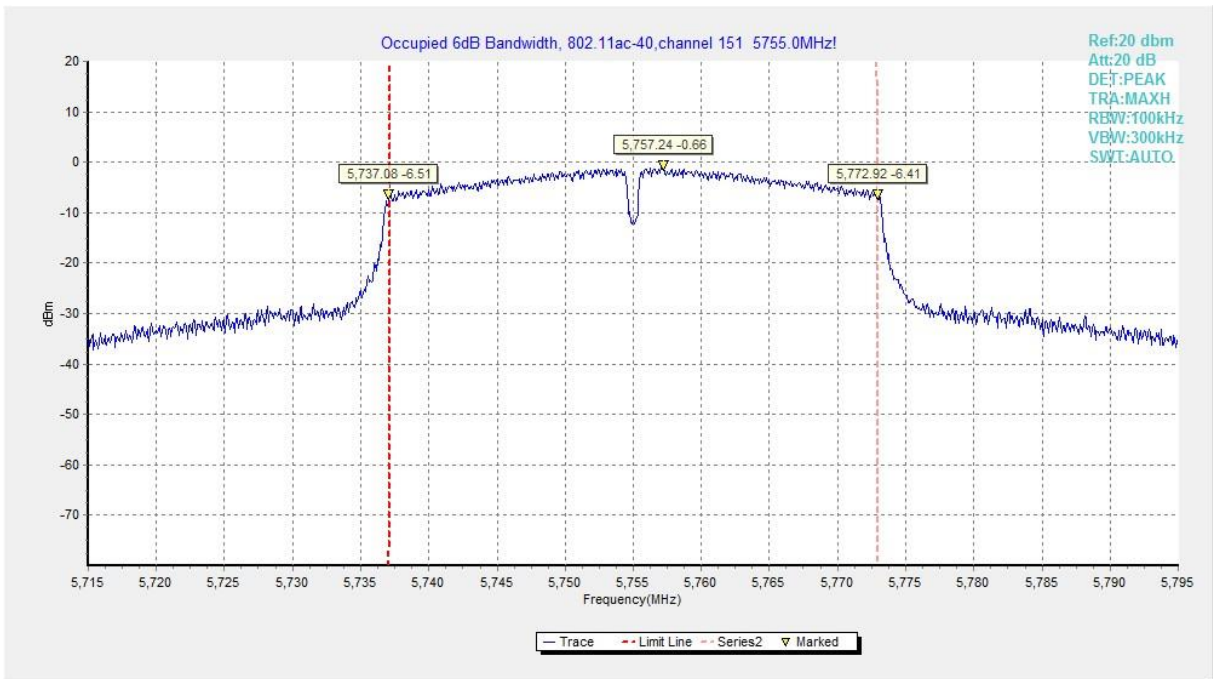


Fig. 12 Occupied 6dB Bandwidth (802.11ac-HT40, Ch 151)

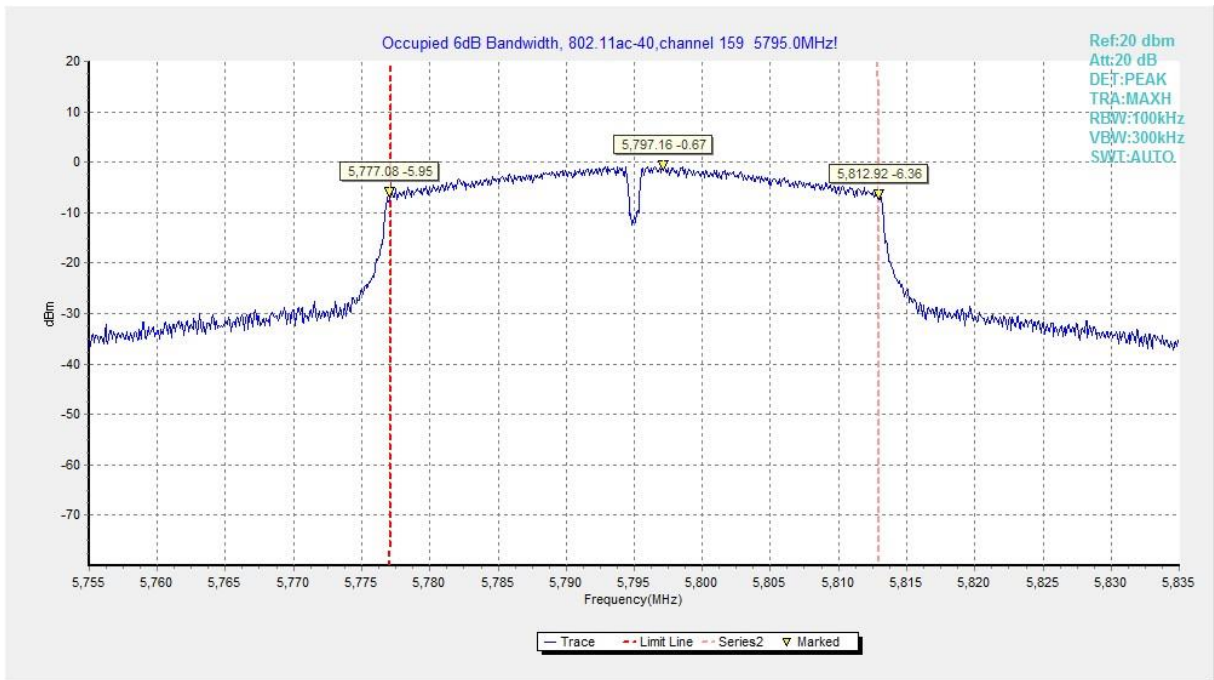


Fig. 13 Occupied 6dB Bandwidth (802.11ac-HT40, Ch 159)

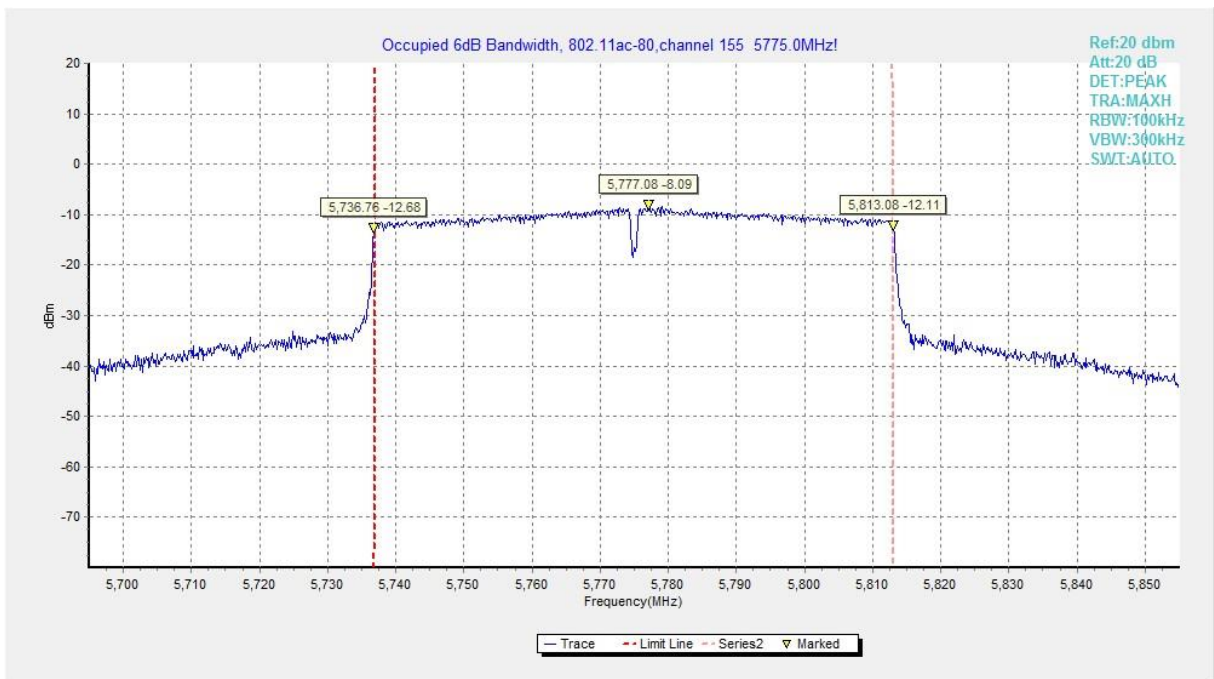


Fig. 14 Occupied 6dB Bandwidth (802.11ac-HT80, Ch 155)

B.5. Transmitter Spurious Emission

Measurement Limit:

Standard	Frequency (MHz)	Limit (dBm/MHz)
FCC 47 CFR Part 15.407	5725MHz~5850MHz	< -27

The measurement is made according to ANSI C63.10 .

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)).

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

Measurement Uncertainty:

Frequency Range	Uncertainty(dB)
30MHz ≤ f ≤ 2GHz	0.63
2GHz ≤ f ≤ 3.6GHz	0.82
3.6GHz ≤ f ≤ 8GHz	1.55
8GHz ≤ f ≤ 20GHz	1.86
20GHz ≤ f ≤ 22GHz	1.90
22GHz ≤ f ≤ 26GHz	2.20

B.5.1 Transmitter Spurious Emission - Radiated

Measurement Limit:

Standard	Frequency (MHz)	Limit (dBm/MHz)
FCC 47 CFR Part 15.407	5725MHz~5850MHz	< -27

The measurement is made according to ANSI C63.10.

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 (dBμV/m)	Measurement distance(m)
30-88	100	40.0	3
88-216	150	43.5	3
216-960	200	46.0	3
Above 960	500	54.0	3

Measurement Results:

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.

Average Results:

802.11a

Ch149

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization	Limit (dBuV/m)	Margin (dBuV/m)
17961.5	47.3	-25.5	46.7	26.1	V	54	6.7
17967	47.3	-25.5	46.7	26.1	V	54	6.7
17992.3	47.1	-25.5	46.7	25.9	V	54	6.9
17994.5	47.1	-25.5	46.7	25.9	V	54	6.9
17970.8	47	-25.5	46.7	25.8	V	54	7
17971.1	47.1	-27.1	34.3	39.6	H	54	6.9

Ch157

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization	Limit (dBuV/m)	Margin (dBuV/m)
17965.9	47.2	-25.5	46.7	26	V	54	6.8
17952.2	47.1	-25.5	46.7	25.9	V	54	6.9
17953.2	47	-25.5	46.7	25.8	V	54	7
17997.8	47	-25.5	46.7	25.8	V	54	7
17956	46.9	-25.5	46.7	25.7	V	54	7.1
17991.2	46.9	-25.5	46.7	25.7	V	54	7.1

Ch165

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization	Limit (dBuV/m)	Margin (dBuV/m)
17976.9	47.2	-25.5	46.7	26	V	54	6.8
17977.5	47.2	-25.5	46.7	26	V	54	6.8
17988.5	47.2	-25.5	46.7	26	V	54	6.8
17981.3	47	-25.5	46.7	25.8	V	54	7
17989.5	47	-25.5	46.7	25.8	V	54	7
17990.7	47.1	-27.1	34.4	33	H	54	6.9

802.11n-HT20

Ch149

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization	Limit (dBuV/m)	Margin (dBuV/m)
17980.8	47.2	-25.5	46.7	26	V	54	6.8
17966.5	47	-25.5	46.7	25.8	V	54	7
17941.2	46.9	-25.5	46.7	25.7	V	54	7.1
17953.8	46.9	-25.5	46.7	25.7	V	54	7.1
17954.3	46.9	-25.5	46.7	25.7	V	54	7.1
17955.8	47.3	-27.1	34.3	48.8	H	54	6.7

Ch157

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization	Limit (dBuV/m)	Margin (dBuV/m)
17949.4	47.1	-25.5	46.7	25.9	V	54	6.9
17945	47	-25.5	46.7	25.8	V	54	7
17960.4	46.9	-25.5	46.7	25.7	V	54	7.1
17968.1	46.9	-25.5	46.7	25.7	V	54	7.1
17968.7	46.9	-25.5	46.7	25.7	V	54	7.1
17973.6	46.9	-25.5	46.7	25.7	V	54	7.1

Ch165

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization	Limit (dBuV/m)	Margin (dBuV/m)
17984.6	47.3	-25.5	46.7	26.1	V	54	6.7
17997.8	47.2	-25.5	46.7	26	V	54	6.8
17946.7	47	-25.5	46.7	25.8	V	54	7
17950	47	-25.5	46.7	25.8	V	54	7
17959.8	47	-25.5	46.7	25.8	V	54	7
17960.1	47.2	-27.1	34.4	33.8	H	54	6.8

802.11n-HT40

Ch151

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization	Limit (dBuV/m)	Margin (dBuV/m)
17991.2	47.2	-25.5	46.7	26	V	54	6.8
17970.3	47	-25.5	46.7	25.8	V	54	7
17971.4	47	-25.5	46.7	25.8	V	54	7
17981.3	47	-25.5	46.7	25.8	V	54	7
17936.8	46.9	-25.5	46.7	25.7	V	54	7.1
17937.1	47.2	-27.1	34.3	54.2	H	54	6.8

Ch159

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization	Limit (dBuV/m)	Margin (dBuV/m)
17978.5	47.2	-25.5	46.7	26	V	54	6.8
17986.2	47.2	-25.5	46.7	26	V	54	6.8
17950	47.1	-25.5	46.7	25.9	V	54	6.9
17979.1	47.1	-25.5	46.7	25.9	V	54	6.9
17957.7	47	-25.5	46.7	25.8	V	54	7
17957.9	47.3	-27.1	34.4	33.1	H	54	6.7

802.11ac-HT20

Ch149

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization	Limit (dBuV/m)	Margin (dBuV/m)
17936.2	47	-25.5	46.7	25.8	V	54	7
17950	47	-25.5	46.7	25.8	V	54	7
17957.7	47	-25.5	46.7	25.8	V	54	7
17966.5	47	-25.5	46.7	25.8	V	54	7
17989	47	-25.5	46.7	25.8	V	54	7
17989.5	47.2	-27.1	34.3	47.8	H	54	6.8

Ch157

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization	Limit (dBuV/m)	Magin (dBuV/m)
17964.8	47	-25.5	46.7	25.8	V	54	7
17975.2	47	-25.5	46.7	25.8	V	54	7
17979.7	47	-25.5	46.7	25.8	V	54	7
17991.2	47	-25.5	46.7	25.8	V	54	7
17962	46.9	-25.5	46.7	25.7	V	54	7.1
17980.2	46.9	-25.5	46.7	25.7	V	54	7.1

Ch165

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization	Limit (dBuV/m)	Magin (dBuV/m)
17996.2	47.1	-25.5	46.7	25.9	V	54	6.9
17970.3	47	-25.5	46.7	25.8	V	54	7
17986.2	47	-25.5	46.7	25.8	V	54	7
17992.3	47	-25.5	46.7	25.8	V	54	7
17958.8	46.9	-25.5	46.7	25.7	V	54	7.1
17960.2	47.1	-27.1	34.4	37.8	H	54	6.9

802.11ac-HT40

Ch151

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization	Limit (dBuV/m)	Magin (dBuV/m)
17976.3	47.1	-25.5	46.7	25.9	V	54	6.9
17976.9	47.1	-25.5	46.7	25.9	V	54	6.9
17998.9	47.1	-25.5	46.7	25.9	V	54	6.9
17979.7	47	-25.5	46.7	25.8	V	54	7
17987.9	47	-25.5	46.7	25.8	V	54	7
17988.6	47.2	-27.1	34.3	50.3	H	54	6.8

Ch159

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization	Limit (dBuV/m)	Magin (dBuV/m)
17972.5	47.1	-25.5	46.7	25.9	V	54	6.9
17980.2	47.1	-25.5	46.7	25.9	V	54	6.9
17995	47.1	-25.5	46.7	25.9	V	54	6.9
17951	47	-25.5	46.7	25.8	V	54	7
17967.5	47	-25.5	46.7	25.8	V	54	7
17968.2	47.1	-27.1	34.4	33.2	H	54	6.9

802.11ac-HT80

Ch155

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization	Limit (dBuV/m)	Magin (dBuV/m)
17975.8	47	-25.5	46.7	25.8	V	54	7
17979.7	46.9	-25.5	46.7	25.7	V	54	7.1
17991.8	46.9	-25.5	46.7	25.7	V	54	7.1
17951	46.8	-25.5	46.7	25.6	V	54	7.2
17956.5	46.8	-25.5	46.7	25.6	V	54	7.2
17962	46.8	-25.5	46.7	25.6	V	54	7.2

Peak Results:
802.11a

Ch149

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization	Limit (dBuV/m)	Magin (dBuV/m)
17959.3	58.7	-25.5	46.7	37.5	V	74	15.3
17934	58.6	-25.5	46.7	37.4	V	74	15.4
17966.5	58.6	-25.5	46.7	37.4	V	74	15.4
17941.2	58.3	-25.5	46.7	37.1	V	74	15.7
17976.9	58.1	-25.5	46.7	36.9	V	74	15.9
5725	63.2	-27.1	34.3	56	H	122.2	59

Ch157

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization	Limit (dBuV/m)	Magin (dBuV/m)
17980.8	59.6	-25.5	46.7	38.4	V	74	14.4
17885.6	59.5	-25.5	46.7	38.3	V	74	14.5
17998.3	58.8	-25.5	46.7	37.6	V	74	15.2
17983	58.2	-25.5	46.7	37	V	74	15.8
17945.5	58	-25.5	46.7	36.8	V	74	16
17954.9	58	-25.5	46.7	36.8	V	74	16

Ch165

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization	Limit (dBuV/m)	Magin (dBuV/m)
17977.5	58.6	-25.5	46.7	37.4	V	74	15.4
17990.7	58.6	-25.5	46.7	37.4	V	74	15.4
17939	58.5	-25.5	46.7	37.3	V	74	15.5
17990.1	58.3	-25.5	46.7	37.1	V	74	15.7
17939.5	58	-25.5	46.7	36.8	V	74	16
5850.7	53.9	-27.1	34.4	46.6	H	120.6	66.7

802.11n-HT20

Ch149

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization	Limit (dBuV/m)	Magin (dBuV/m)
17975.2	59.3	-25.5	46.7	38.1	V	74	14.7
17968.1	59.2	-25.5	46.7	38	V	74	14.8
17979.7	58.7	-25.5	46.7	37.5	V	74	15.3
17925.8	58.4	-25.5	46.7	37.2	V	74	15.6
17971.4	58.4	-25.5	46.7	37.2	V	74	15.6
5724.7	72	-27.1	34.3	64.8	H	121.5	49.5

Ch157

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization	Limit (dBuV/m)	Magin (dBuV/m)
17986.8	58.4	-25.5	46.7	37.2	V	74	15.6
17983	58.3	-25.5	46.7	37.1	V	74	15.7
17857.5	58.2	-25.5	46.7	37	V	74	15.8
17993.4	58.1	-25.5	46.7	36.9	V	74	15.9
17956	57.9	-25.5	46.7	36.7	V	74	16.1
17922.5	57.7	-25.5	46.7	36.5	V	74	16.3

Ch165

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization	Limit (dBuV/m)	Magin (dBuV/m)
17862.5	58.4	-25.5	46.7	37.2	V	74	15.6
17871.3	58.2	-25.5	46.7	37	V	74	15.8
17985.7	58.2	-25.5	46.7	37	V	74	15.8
17976.9	58.1	-25.5	46.7	36.9	V	74	15.9
17946.1	58	-25.5	46.7	36.8	V	74	16
5851.3	55.4	-27.1	34.4	48.1	H	119.2	63.8

802.11n-HT40

Ch151

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization	Limit (dBuV/m)	Magin (dBuV/m)
17979.7	58.7	-25.5	46.7	37.5	V	74	15.3
17961	58.5	-25.5	46.7	37.3	V	74	15.5
17996.7	58.5	-25.5	46.7	37.3	V	74	15.5
17978.5	58.4	-25.5	46.7	37.2	V	74	15.6
17968.7	58	-25.5	46.7	36.8	V	74	16
5723.6	73.7	-27.1	34.3	66.5	H	119	45.3

Ch159

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization	Limit (dBuV/m)	Magin (dBuV/m)
17986.2	58.6	-25.5	46.7	37.4	V	74	15.4
17985.2	58.3	-25.5	46.7	37.1	V	74	15.7
17998.9	58.2	-25.5	46.7	37	V	74	15.8
17863	57.9	-25.5	46.7	36.7	V	74	16.1
17940.6	57.9	-25.5	46.7	36.7	V	74	16.1
5851.5	54.3	-27.1	34.4	47	H	118.8	64.5

802.11ac-HT20

Ch149

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization	Limit (dBuV/m)	Magin (dBuV/m)
17980.8	59.1	-25.5	46.7	37.9	V	74	14.9
17987.3	58.4	-25.5	46.7	37.2	V	74	15.6
17949.4	58.1	-25.5	46.7	36.9	V	74	15.9
17964.8	58.1	-25.5	46.7	36.9	V	74	15.9
17983.5	57.9	-25.5	46.7	36.7	V	74	16.1
5724.1	70.3	-27.1	34.3	63.1	H	120.1	49.8

Ch157

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization	Limit (dBuV/m)	Magin (dBuV/m)
17959.8	58.7	-25.5	46.7	37.5	V	74	15.3
17984	58.3	-25.5	46.7	37.1	V	74	15.7
17981.8	58.2	-25.5	46.7	37	V	74	15.8
17987.9	57.9	-25.5	46.7	36.7	V	74	16.1
17991.2	57.9	-25.5	46.7	36.7	V	74	16.1
17965.9	57.8	-25.5	46.7	36.6	V	74	16.2

Ch165

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization	Limit (dBuV/m)	Magin (dBuV/m)
17996.2	58.3	-25.5	46.7	37.1	V	74	15.7
17984.6	58.2	-25.5	46.7	37	V	74	15.8
17958.8	58	-25.5	46.7	36.8	V	74	16
17968.1	58	-25.5	46.7	36.8	V	74	16
17852.6	57.9	-25.5	46.7	36.7	V	74	16.1
5851.4	62.2	-27.1	34.4	54.9	H	119	56.8

802.11ac-HT40

Ch151

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization	Limit (dBuV/m)	Magin (dBuV/m)
17876.2	59.8	-25.5	46.7	38.6	V	74	14.2
17970.8	59.2	-25.5	46.7	38	V	74	14.8
17978.5	58.4	-25.5	46.7	37.2	V	74	15.6
17972.5	58.2	-25.5	46.7	37	V	74	15.8
17979.7	58.2	-25.5	46.7	37	V	74	15.8
5723.8	70.9	-27.1	34.3	63.7	H	119.5	48.6

Ch159

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization	Limit (dBuV/m)	Magin (dBuV/m)
17968.7	58.7	-25.5	46.7	37.5	V	74	15.3
17985.7	58.5	-25.5	46.7	37.3	V	74	15.5
17865.2	58.4	-25.5	46.7	37.2	V	74	15.6
17956.5	58	-25.5	46.7	36.8	V	74	16
17908.2	57.9	-25.5	46.7	36.7	V	74	16.1
5854.5	52.6	-27.1	34.4	45.3	H	111.9	59.3

802.11ac-HT80

Ch155

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	P _{Mea} (dBuV/m)	Polarization	Limit (dBuV/m)	Margin (dBuV/m)
17931.2	58.3	-25.5	46.7	37.1	V	74	15.7
17998.3	58.3	-25.5	46.7	37.1	V	74	15.7
17882.8	58.1	-25.5	46.7	36.9	V	74	15.9
17930.2	58.1	-25.5	46.7	36.9	V	74	15.9
17969.2	58.1	-25.5	46.7	36.9	V	74	15.9
17961	58	-25.5	46.7	36.8	V	74	16

Conclusion: PASS

B.6. Band Edges Compliance

B.6.1 Band Edges - Radiated

Measurement Limit:

Standard	Limit (dBm/MHz)	
	FCC 47 CFR Part 15.407	at the band edge
at 5 MHz above or below the band edge		15.6
at 25 MHz above or below the band edge		10
at 75 MHz or more above or below the band edge		-27
Note: increasing linearly from point to point.		

The measurement is made according to KDB 789033 D02

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 Result:

Mode	Channel	Test Results	Conclusion
802.11a	5745 MHz	Fig.15	P
	5825 MHz	Fig.16	P
802.11n HT20	5745 MHz	Fig.17	P
	5825 MHz	Fig.18	P
802.11ac HT20	5745 MHz	Fig.19	P
	5825 MHz	Fig.20	P
802.11n HT40	5755 MHz	Fig.21	P
	5795 MHz	Fig.22	P
802.11ac HT40	5755 MHz	Fig.23	P
	5795 MHz	Fig.24	P
802.11ac HT80	5775 MHz	Fig.25	P
	5775 MHz	Fig.26	P

Conclusion: PASS

Test graphs as below:

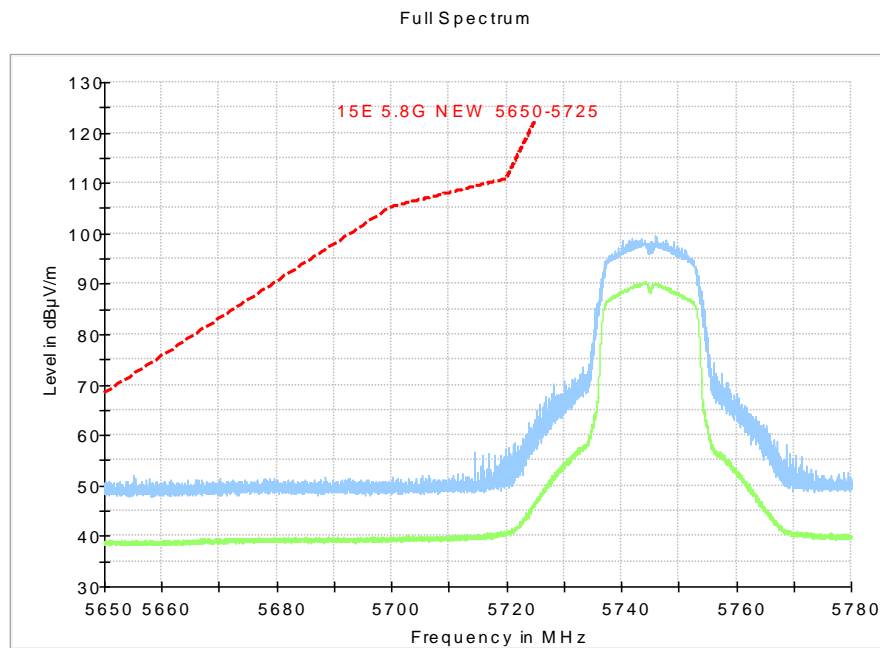


Fig. 15 Band Edges (802.11a, 5745MHz)

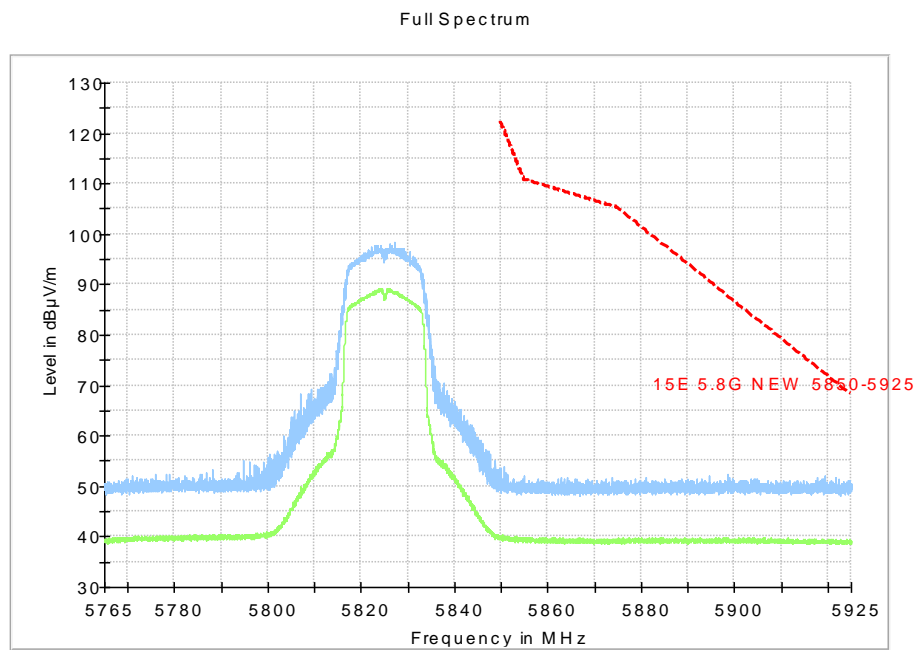


Fig. 16 Band Edges (802.11a, 5825MHz)

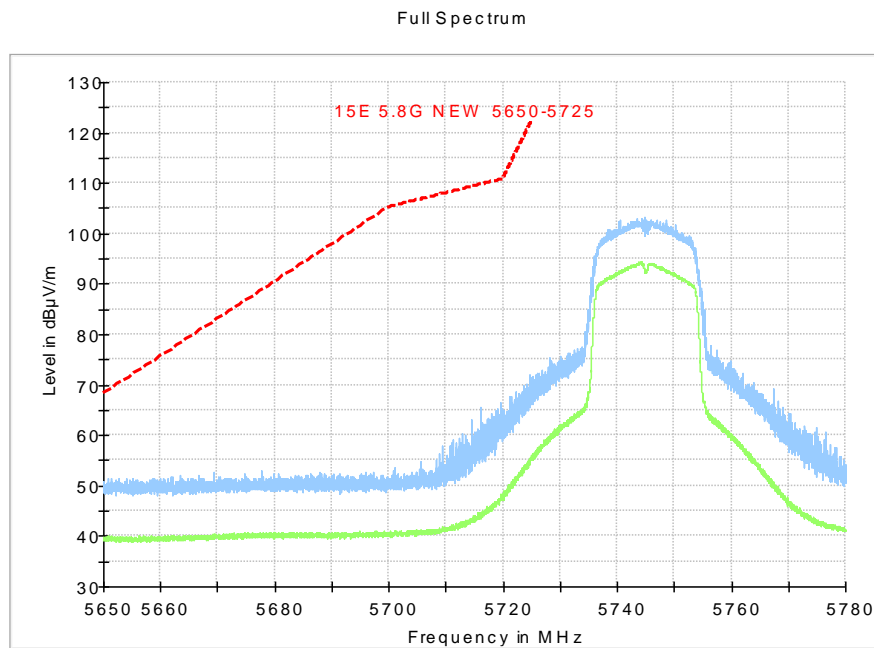


Fig. 17 Band Edges (802.11n-HT20, 5745MHz)

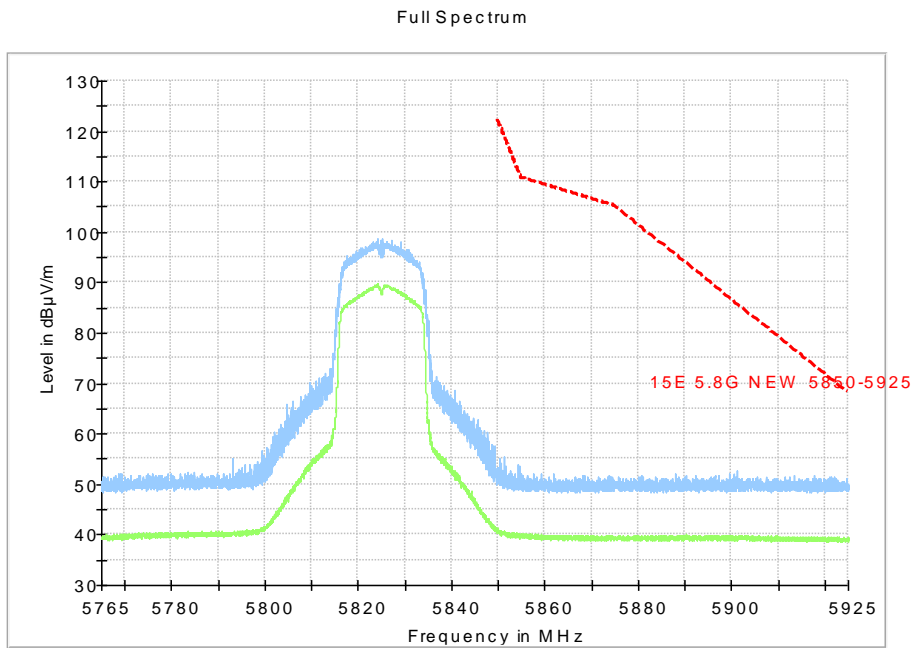


Fig. 18 Band Edges (802.11n-HT20, 5825MHz)

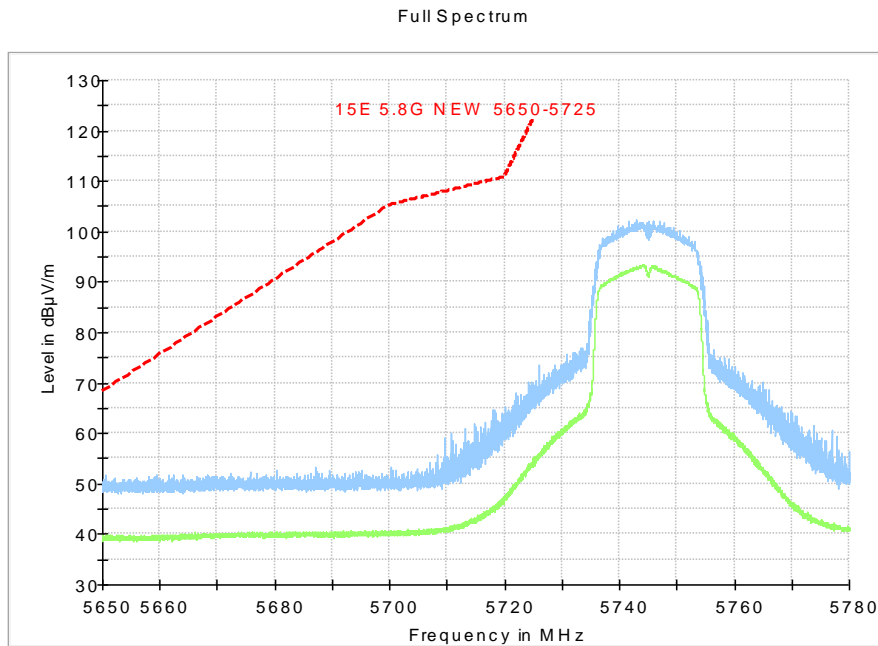


Fig. 19 Band Edges (802.11ac-HT20, 5745MHz)

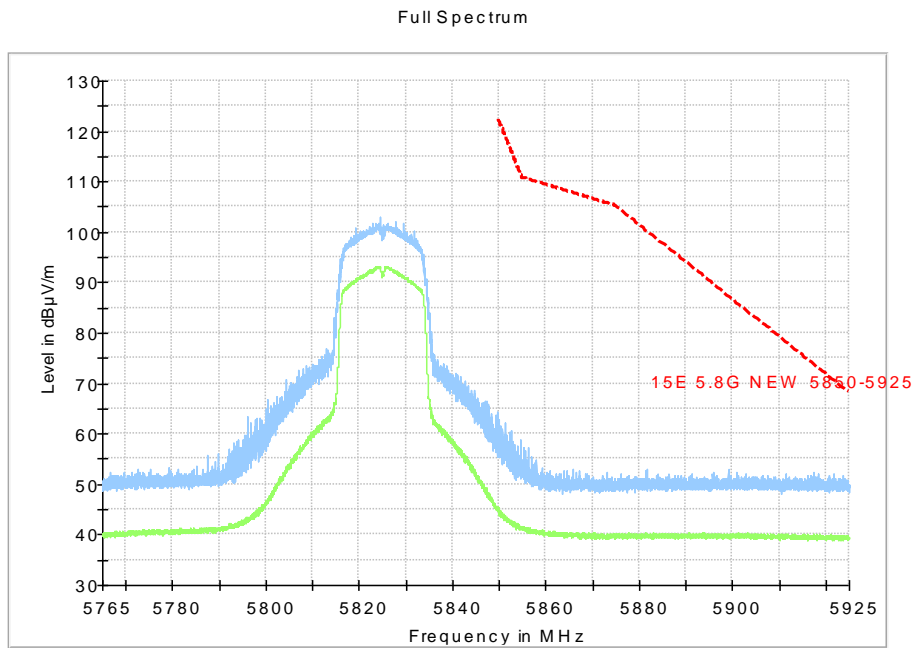


Fig. 20 Band Edges (802.11ac-HT20, 5825MHz)

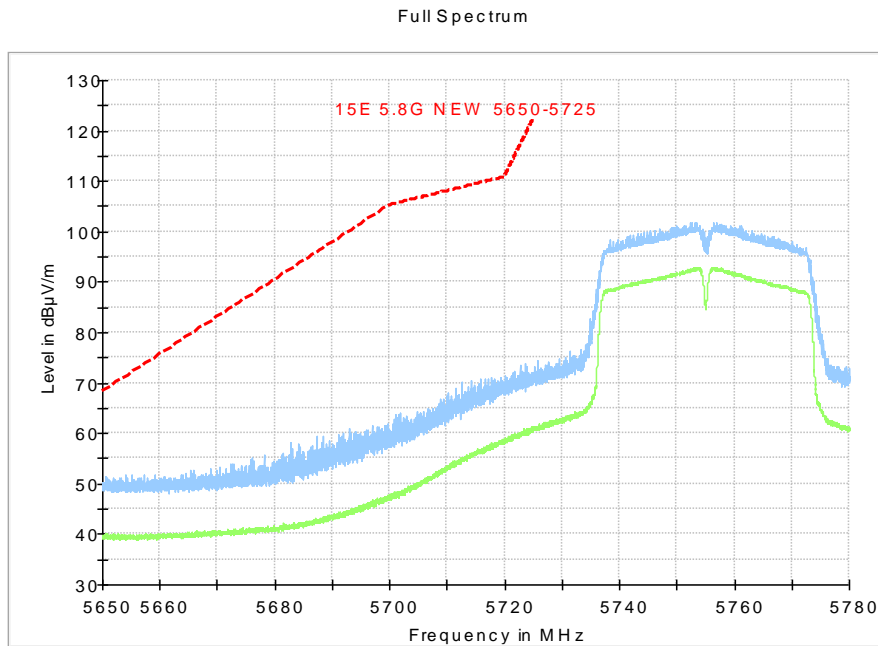


Fig. 21 Band Edges (802.11n-HT40, 5755MHz)

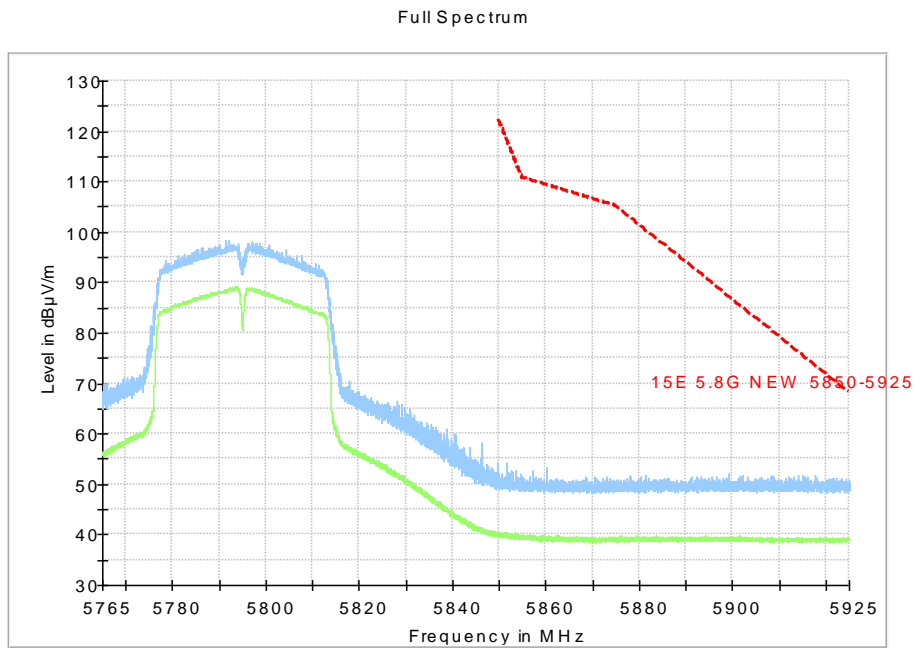


Fig. 22 Band Edges (802.11n-HT40, 5795MHz)

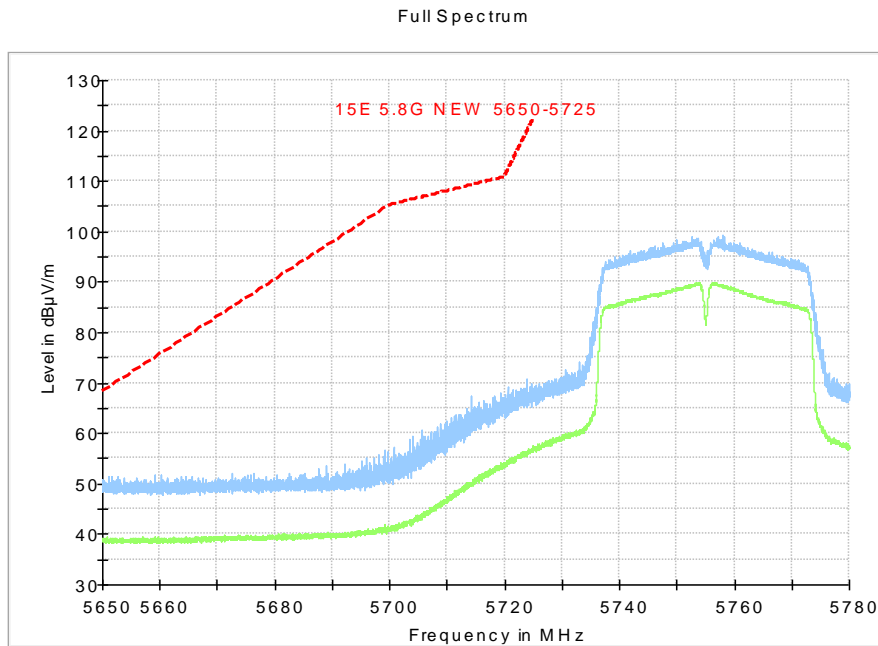


Fig. 23 Band Edges (802.11ac-HT40, 5755MHz)

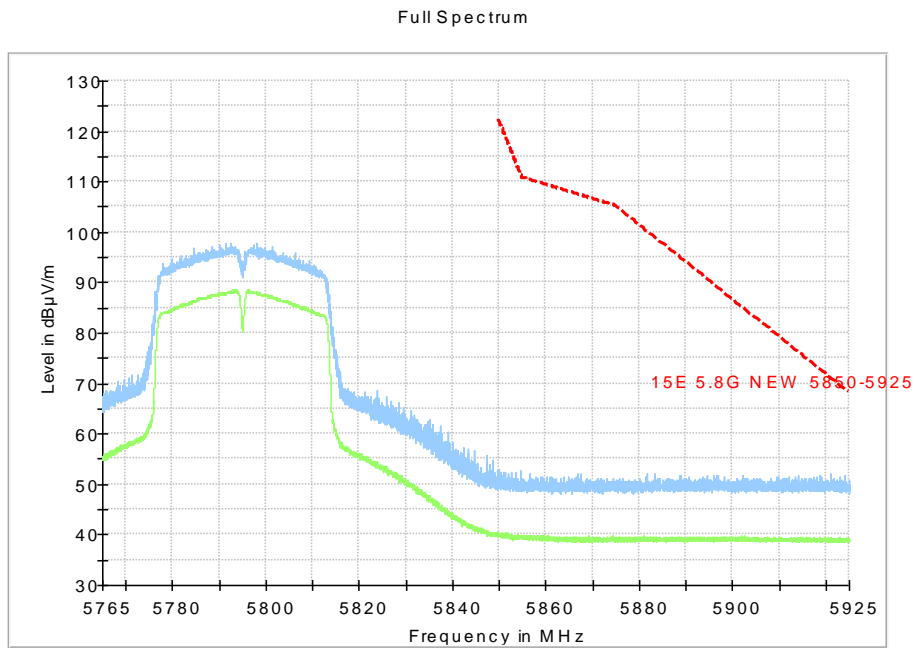


Fig. 24 Band Edges (802.11ac-HT40, 5795MHz)

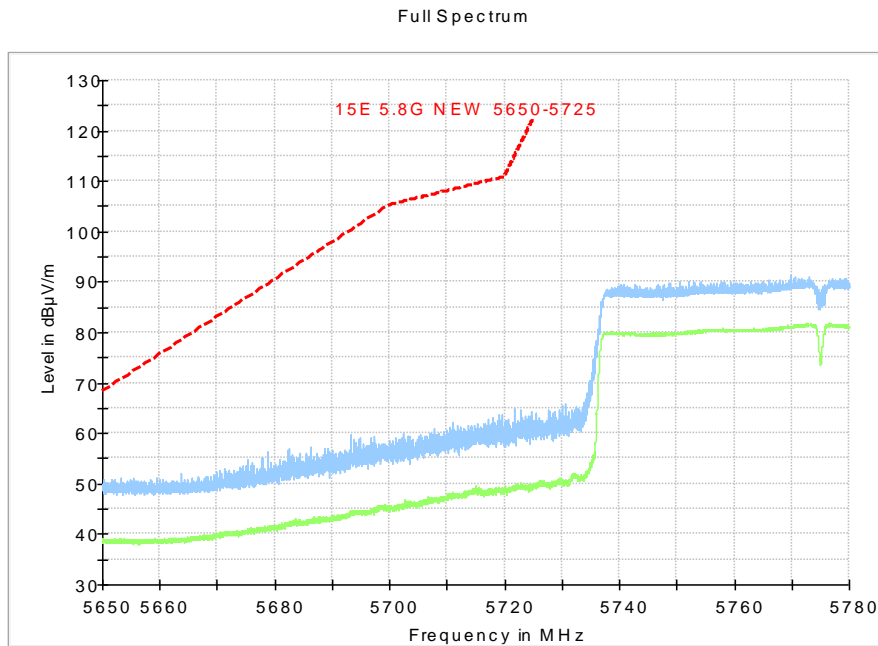


Fig. 25 Band Edges (802.11ac-HT80, 5775MHz)

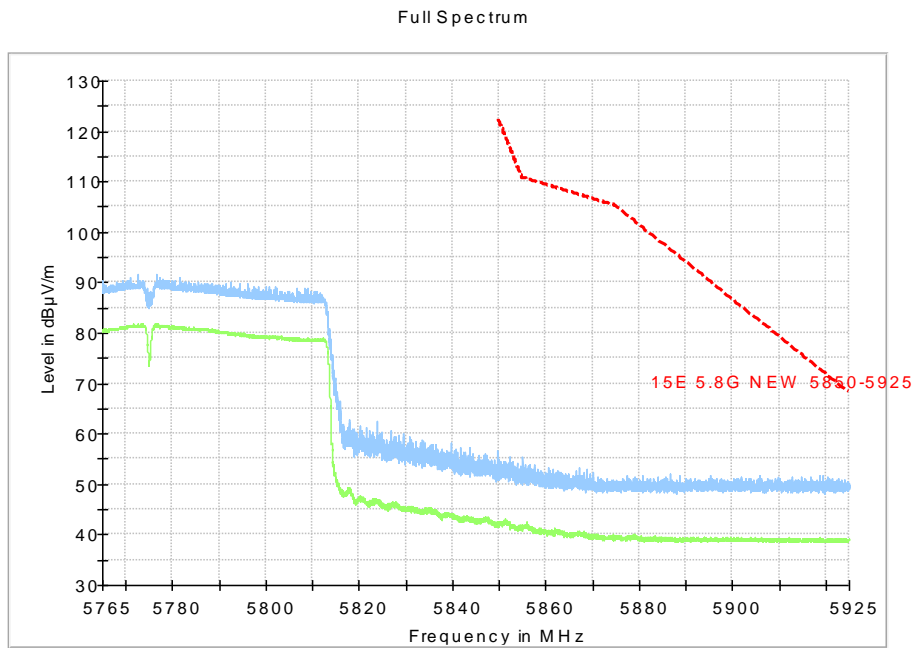


Fig. 26 Band Edges (802.11ac-HT80, 5775MHz)

B.7. AC Powerline Conducted Emission

Test Condition:

Voltage (V)	Frequency (Hz)
110	60

Measurement Result and limit:

WLAN (Quasi-peak Limit)

Frequency range (MHz)	Quasi-peak Limit (dB μ V)	Result (dB μ V)		Conclusion
		With charger		
		802.11a	Idle	
0.15 to 0.5	66 to 56	Fig. 27	Fig. 28	P
0.5 to 5	56			
5 to 30	60			

NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

WLAN (Average Limit)

Frequency range (MHz)	Average Limit (dB μ V)	Result (dB μ V)		Conclusion
		With charger		
		802.11a	Idle	
0.15 to 0.5	56 to 46	Fig. 27	Fig. 28	P
0.5 to 5	46			
5 to 30	50			

Note: The measurement results showed here are worst cases.

Conclusion: PASS

Test graphs as below:

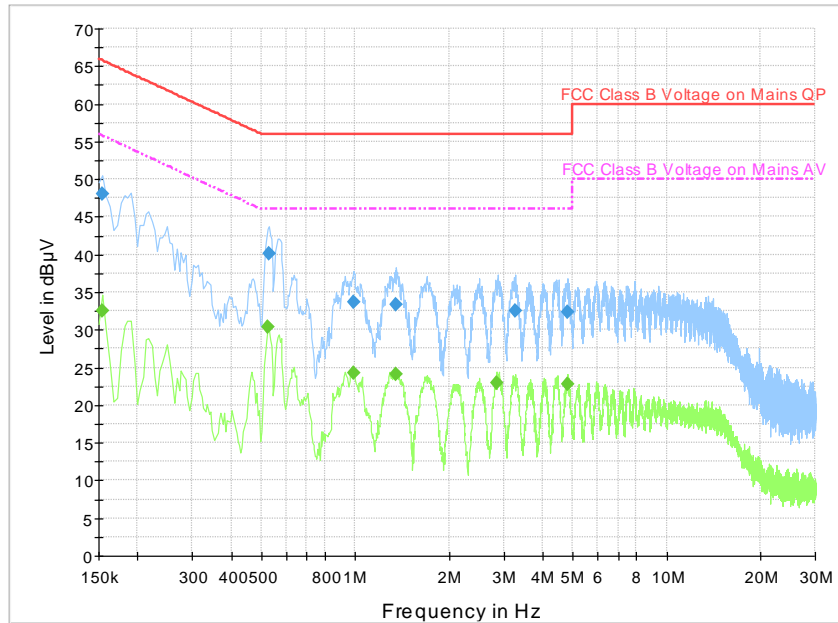


Fig. 27 AC Powerline Conducted Emission-802.11a

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.154500	48.0	L1	19.7	17.8	65.8
0.528000	40.1	N	19.5	15.9	56.0
0.987000	33.7	L1	19.6	22.3	56.0
1.356000	33.4	L1	19.6	22.6	56.0
3.264000	32.5	N	19.6	23.5	56.0
4.807500	32.4	L1	19.8	23.6	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.154500	32.4	N	19.5	23.3	55.8
0.523500	30.3	L1	19.6	15.7	46.0
0.987000	24.3	N	19.6	21.7	46.0
1.356000	24.2	N	19.6	21.8	46.0
2.850000	23.0	L1	19.6	23.0	46.0
4.807500	22.8	L1	19.8	23.2	46.0

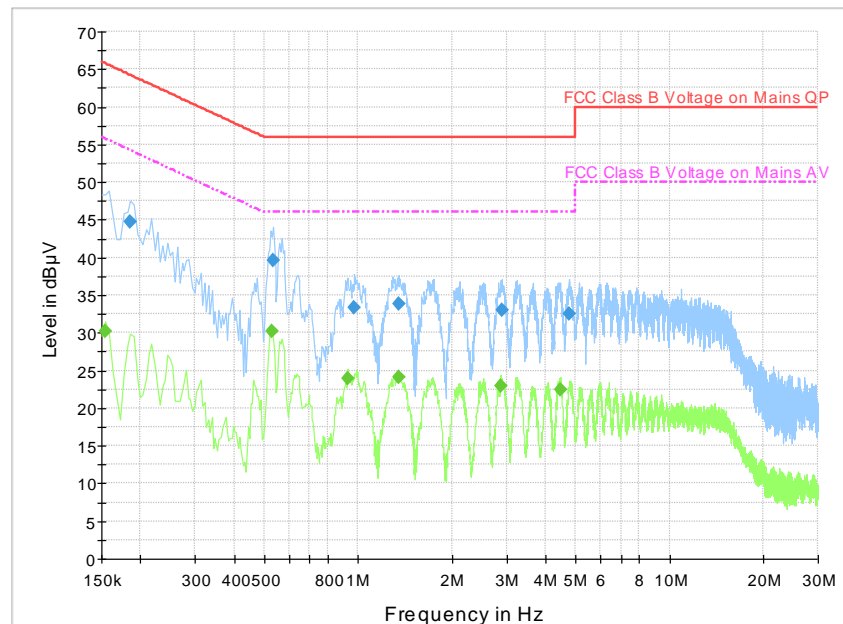


Fig. 28 AC Powerline Conducted Emission-Idle




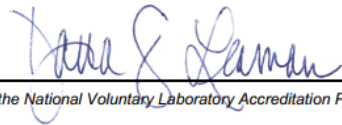
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.186000	44.7	L1	19.7	19.5	64.2
0.532500	39.6	L1	19.6	16.4	56.0
0.973500	33.4	L1	19.6	22.6	56.0
1.351500	33.8	N	19.6	22.2	56.0
2.890500	32.9	L1	19.6	23.1	56.0
4.744500	32.5	L1	19.8	23.5	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.154500	30.3	L1	19.7	25.5	55.8
0.528000	30.2	L1	19.6	15.8	46.0
0.928500	24.0	L1	19.6	22.0	46.0
1.351500	24.2	L1	19.6	21.8	46.0
2.863500	22.9	L1	19.6	23.1	46.0
4.456500	22.5	L1	19.8	23.5	46.0

ANNEX C: Accreditation Certificate

<p>United States Department of Commerce National Institute of Standards and Technology</p>  	
<hr/> Certificate of Accreditation to ISO/IEC 17025:2017 <hr/>	
NVLAP LAB CODE: 600118-0	
Telecommunication Technology Labs, CAICT Beijing China	
<i>is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for:</i>	
Electromagnetic Compatibility & Telecommunications	
<i>This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).</i>	
2020-09-29 through 2021-09-30 <i>Effective Dates</i>	  <i>For the National Voluntary Laboratory Accreditation Program</i>

*** END OF REPORT BODY ***