



FCC PART 15C TEST REPORT No.I20Z60764-IOT05

for

Client name: TCL Communication Ltd.

Product name: 5G NR/ LTE/WCDMA/GSM Mobile Phone

Model name: T790W,T790Z

With

FCC ID: 2ACCJN039

Hardware Version: 05

Software Version: 6BSEE000

Issued Date: 2020-07-03

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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I20Z60764-IOT05	Rev.0	1st edition	2020-07-03

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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 FC

C 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(huayuan North Road)

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

Radiated testing Location: CTTL(huayuan North Road)

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

1.3. Testing Environment

Normal Temperature: 15-35°C

Relative Humidity: 20-75%

1.4. Project date

Testing Start Date: 2020-05-14

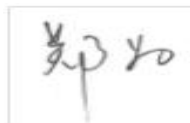
Testing End Date: 2020-07-02

1.5. Signature



Jiang Xue

(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: TCL Communication Ltd.
Address: 5/F, Building 22E, 22 Science Park East Avenue, Hong Kong Science Park, Shatin, NT, Hong Kong
City: Hong Kong
Postal Code: /
Country: China
Telephone: 0086-755-36611722
Fax: 0086-755-36612000-81722

2.2. Manufacturer Information

Company Name: TCL Communication Ltd.
Address: 5/F, Building 22E, 22 Science Park East Avenue, Hong Kong Science Park, Shatin, NT, Hong Kong
City: Hong Kong
Postal Code: /
Country: China
Telephone: 0086-755-36611722
Fax: 0086-755-36612000-81722

3. EQUIPMENT UNDER TEST (EUT) AND ANCILLARY

EQUIPMENT(AE)

3.1. About EUT

Description	5G NR/ LTE/WCDMA/GSM Mobile Phone		
Model name	T790W,T790Z		
FCC ID	2ACCJN039		
WLAN Frequency Range	ISM Band: 5725MHz~5850MHz		
Type of modulation	OFDM		
Voltage	3.85V		
Antenna Gain	-2.1dBi(ant5),-1.9dBi(ant6)		
Antenna Function Description	802.11a/n/ac MIMO	Ant5	Ant6

3.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version
EUT1	015710000201175	05	6BSEE000
EUT2	015710000200649	05	6BSEE000

*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	SN
AE1	Battery	/

*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 5G NR/ LTE/WCDMA/GSM Mobile 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 - Radiated	15.407 (b)	/	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	2021-05-17
3	Test Receiver	ESCI 7	100344	Rohde & Schwarz	1 year	2021-02-26
4	Shielding Room	S81	/	ETS-Lindgren	/	/

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	483	Schwarzbeck	1 years	2020-09-17
3	Dual-Ridge Waveguide Horn Antenna	3115	6914	ETS-Lindgren	1 years	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	/
$30\text{MHz} \leq f \leq 1\text{GHz}$	5.40
$1\text{GHz} \leq f \leq 18\text{GHz}$	4.32
$18\text{GHz} \leq f \leq 40\text{GHz}$	5.26

8.6. AC Power-line Conducted Emission

Measurement Uncertainty : 3.08dB, k=2

ANNEX A: MEASUREMENT RESULTS

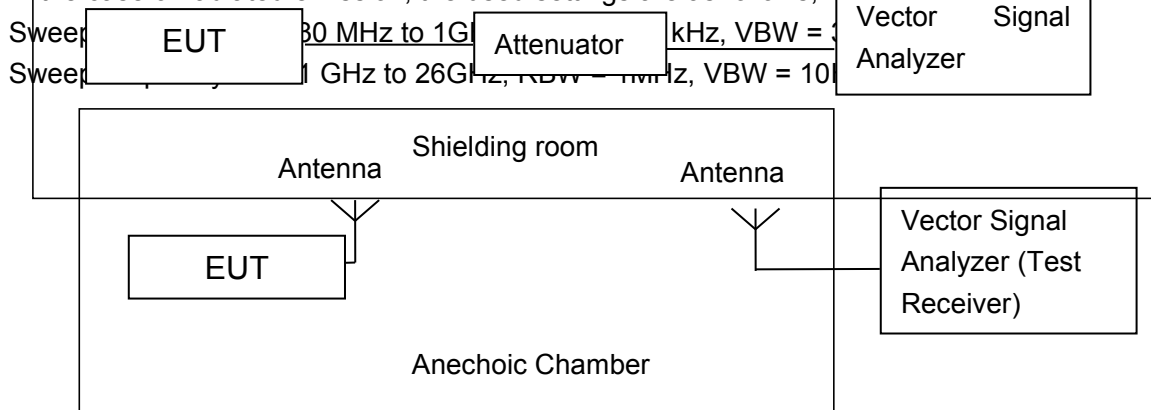
A.1. Measurement Method

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,



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.

A.2. Maximum Peak Output Power

Measurement Limit and Method:

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

A.2.2. Maximum Average Output Power-conducted

Measurement Results: Duty Cycle:

11a	6Mbps
Duty Cycle	99%
11n-20	MCS0
Duty Cycle	99%
11n-40	MCS0
Duty Cycle	99%
11ac-20	MCS0
Duty Cycle	99%
11ac-40	MCS0
Duty Cycle	99%
11ac-80	MCS0
Duty Cycle	99%

The data rate 6Mbps(11a),MCS0(11n-20),MCS0(11ac-20),MCS0(11n-40),MCS0(11ac-40) and MCS0(11ac-80) are selected as worse condition declared by client, and the following cases are performed with this condition.

5GHz Band								
Mode	Date Rate	Chnanel	Freq.(MHz)	Average Conducted Power (dBm)			Limit(dBm)	Pass/Fail
				Ant5	Ant6	SUM		
11a	6Mbps	149	5745 MHz	16.31	17.22	19.80	30.00	Pass
11a	6Mbps	157	5785 MHz	16.61	17.10	19.87	30.00	Pass
11a	6Mbps	165	5825 MHz	16.12	16.10	19.12	30.00	Pass
11n-20	MCS0	149	5745 MHz	15.32	16.36	18.88	30.00	Pass
11n-20	MCS0	157	5785 MHz	15.81	16.96	19.43	30.00	Pass
11n-20	MCS0	165	5825 MHz	15.47	15.77	18.63	30.00	Pass
11ac-20	MCS0	149	5745 MHz	14.85	15.99	18.47	30.00	Pass
11ac-20	MCS0	157	5785 MHz	15.31	16.52	18.97	30.00	Pass
11ac-20	MCS0	165	5825 MHz	15.09	15.29	18.20	30.00	Pass
11n-40	MCS0	151	5755 MHz	16.73	16.93	19.84	30.00	Pass
11n-40	MCS0	159	5795 MHz	16.34	17.14	19.77	30.00	Pass
11ac-40	MCS0	151	5825 MHz	15.67	16.46	19.09	30.00	Pass
11ac-40	MCS0	159	5745 MHz	15.94	16.49	19.23	30.00	Pass
11ac-80	MCS0	155	5775 MHz	14.45	15.31	17.91	30.00	Pass

Conclusion: PASS

A.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
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Measurement Results:

5GHz Band									
Mode	Data Rate	Channel	Freq.(MHz)	Peak Power Spectral Density (dBm/500 kHz)			Peak Power Spectral Density Limit (dBm/500 kHz)		Pass/Fail
				Ant5	Ant6	SUM	Ant5	Ant6	
11a	6Mbps	149	5745 MHz	1.77	3.56	5.77	30.00		Pass
11a	6Mbps	157	5785 MHz	2.46	4.38	6.54	30.00		Pass
11a	6Mbps	165	5825 MHz	2.44	3.19	5.84	30.00		Pass
11n-20	MCS0	149	5745 MHz	0.83	2.69	4.87	30.00		Pass
11n-20	MCS0	157	5785 MHz	1.11	3.37	5.40	30.00		Pass
11n-20	MCS0	165	5825 MHz	1.39	2.15	4.80	30.00		Pass
11ac-20	MCS0	149	5745 MHz	-0.49	2.05	3.97	30.00		Pass
11ac-20	MCS0	157	5785 MHz	0.69	2.06	4.44	30.00		Pass
11ac-20	MCS0	165	5825 MHz	0.90	1.71	4.33	30.00		Pass
11n-40	MCS0	151	5755 MHz	-2.10	0.10	2.15	30.00		Pass
11n-40	MCS0	159	5795 MHz	-0.92	0.62	2.93	30.00		Pass
11ac-40	MCS0	151	5825 MHz	-2.55	-0.45	1.64	30.00		Pass
11ac-40	MCS0	159	5745 MHz	-1.76	0.18	2.33	30.00		Pass
11ac-80	MCS0	159	5775 MHz	-6.04	-4.39	-2.13	30.00		Pass

Conclusion: PASS

A.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
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Measurement Result:

Mode	Channel	Occupied 6dB Bandwidth (MHz)		conclusion
		Fig.	Value	
802.11a	149	Fig.1	15.15	P
	157	Fig.2	15.50	P
	165	Fig.3	15.35	P
802.11n HT20	149	Fig.4	16.10	P
	157	Fig.5	16.55	P
	165	Fig.6	15.10	P
802.11ac HT20	149	Fig.7	16.55	P
	157	Fig.8	16.15	P
	165	Fig.9	15.10	P
802.11n HT40	151	Fig.10	35.12	P
	159	Fig.11	35.68	P
802.11ac HT40	151	Fig.12	35.20	P
	159	Fig.13	35.32	P
802.11ac HT80	155	Fig.14	75.36	P

Conclusion: PASS

Test graphs as below:

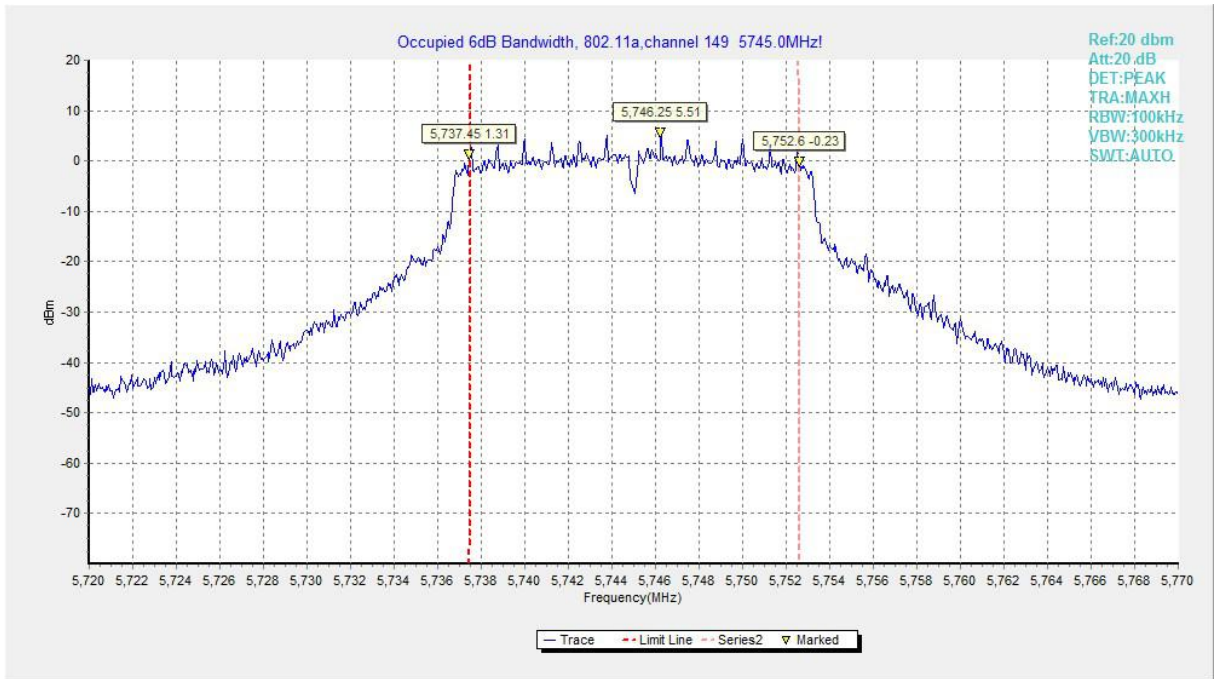


Fig. 1 Occupied 6dB Bandwidth (802.11a, Ch 149)

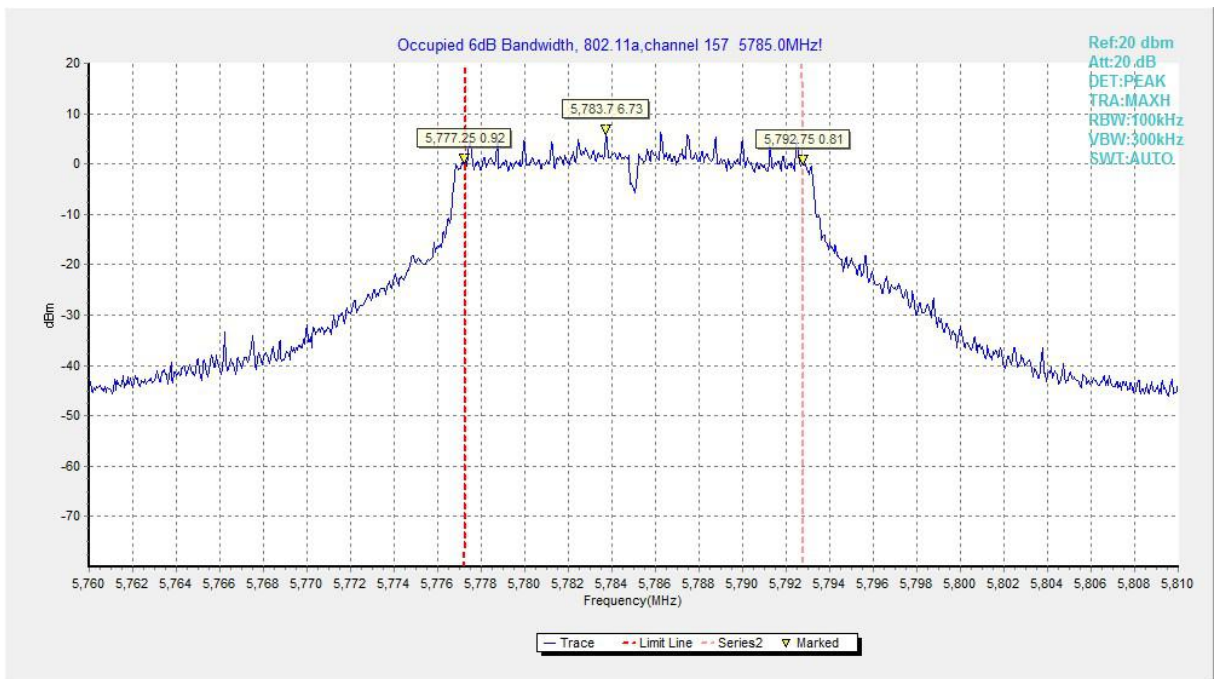


Fig. 2 Occupied 6dB Bandwidth (802.11a, Ch 157)

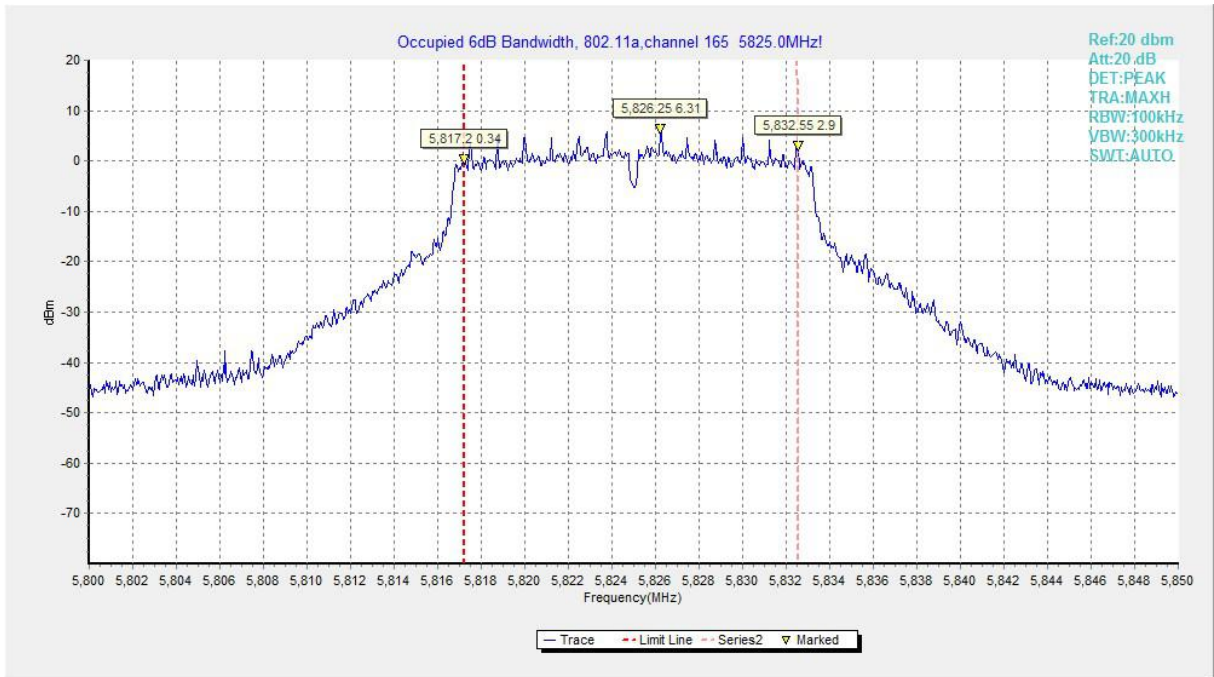


Fig. 3 Occupied 6dB Bandwidth (802.11a, Ch 165)

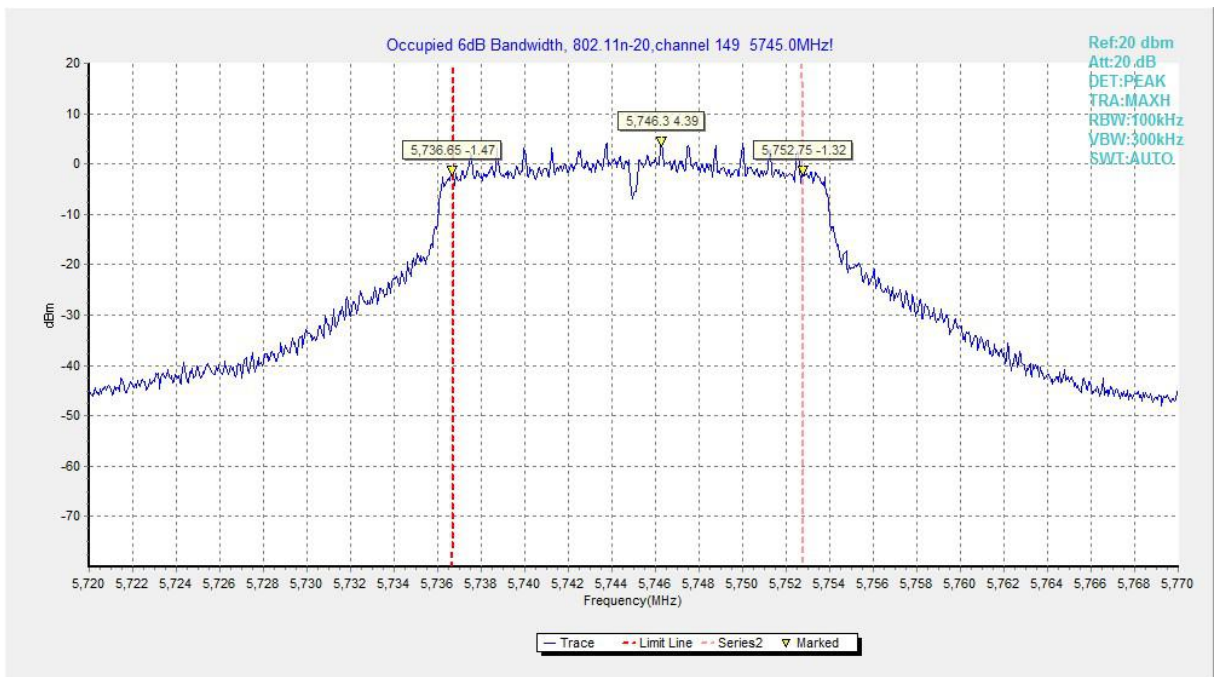


Fig. 4 Occupied 6dB Bandwidth (802.11n-HT20, Ch 149)

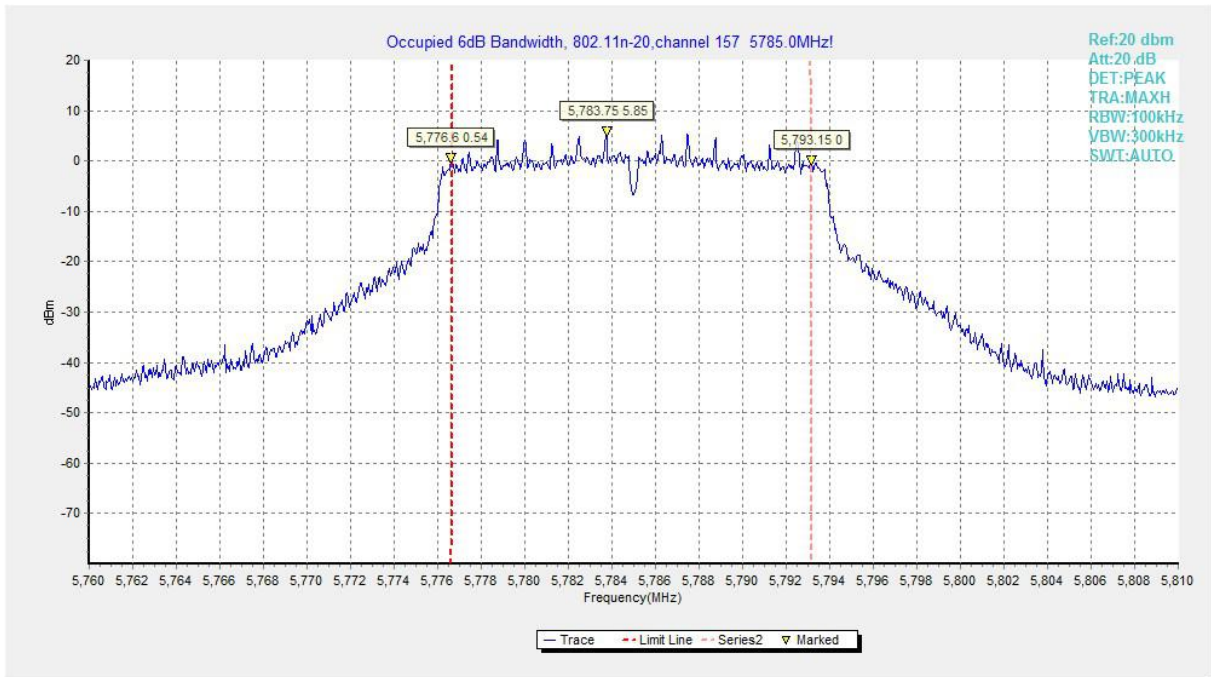


Fig. 5 Occupied 6dB Bandwidth (802.11n-HT20, Ch 157)

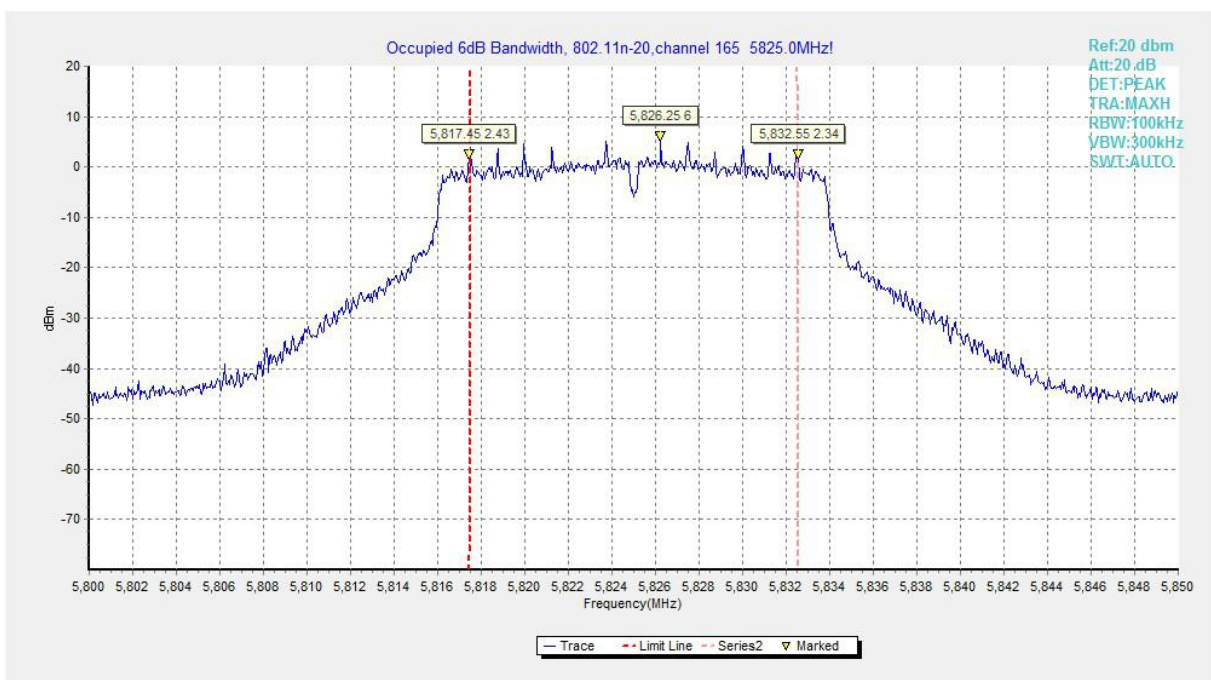


Fig. 6 Occupied 6dB Bandwidth (802.11n-HT20, Ch 165)

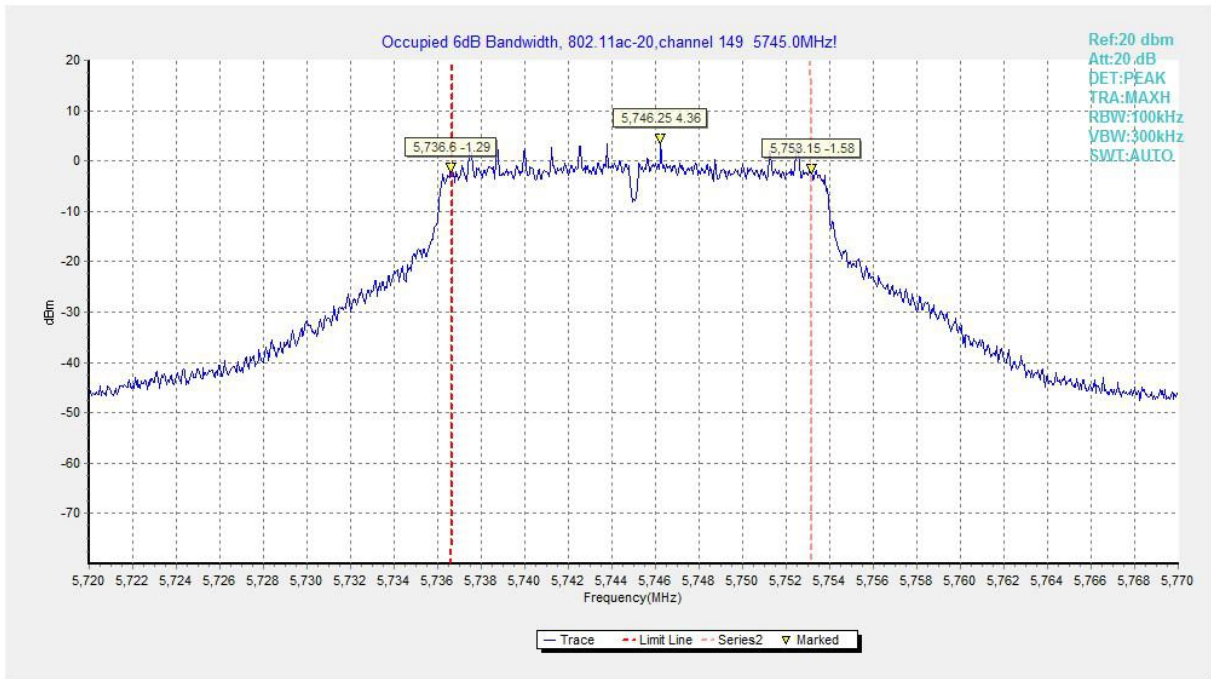


Fig. 7 Occupied 6dB Bandwidth (802.11ac-HT20, Ch 149)

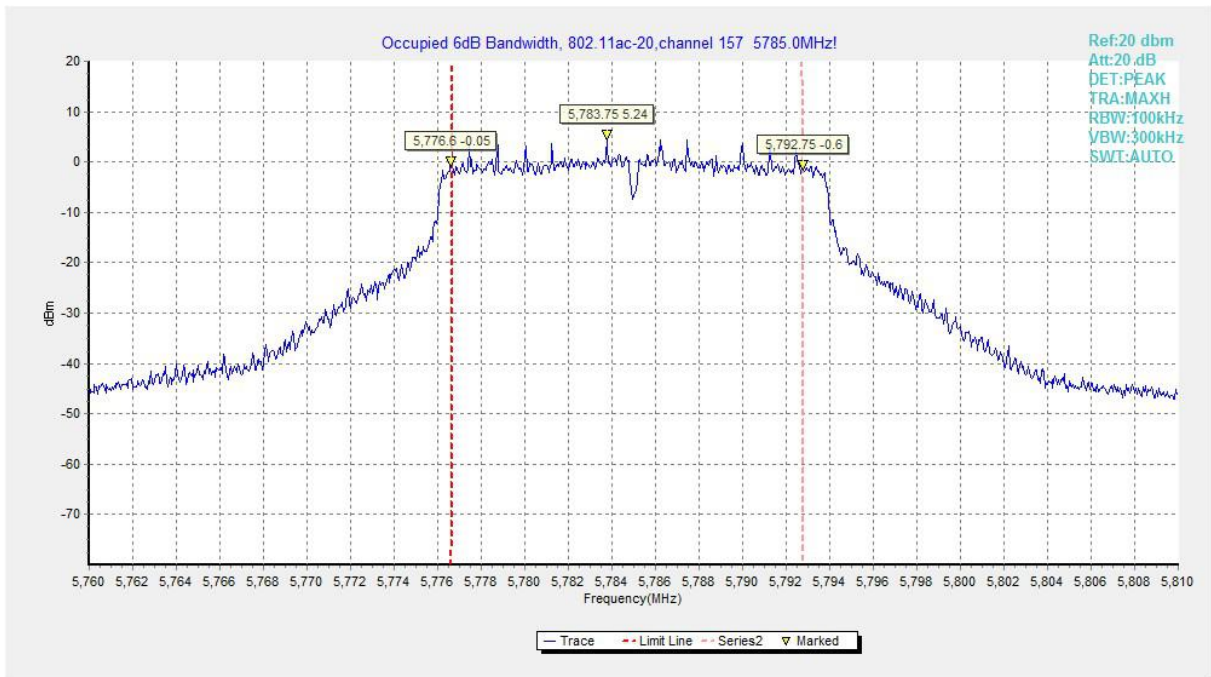


Fig. 8 Occupied 6dB Bandwidth (802.11ac-HT20, Ch 157)

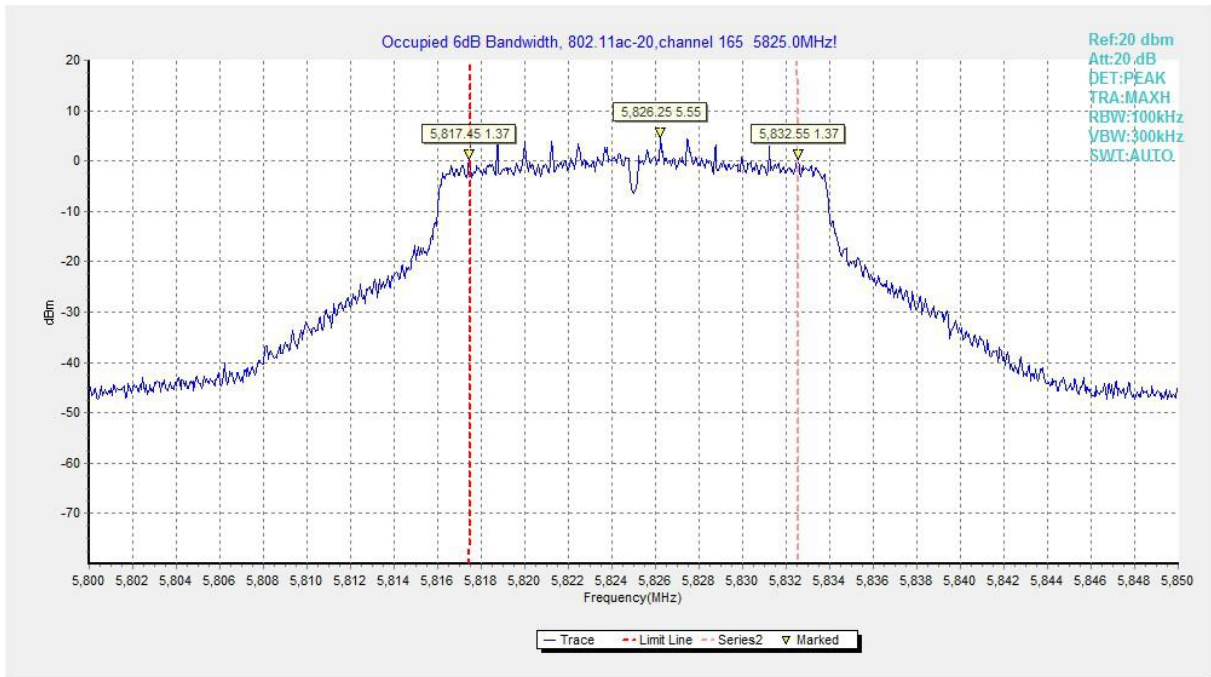


Fig. 9 Occupied 6dB Bandwidth (802.11ac-HT20, Ch 165)

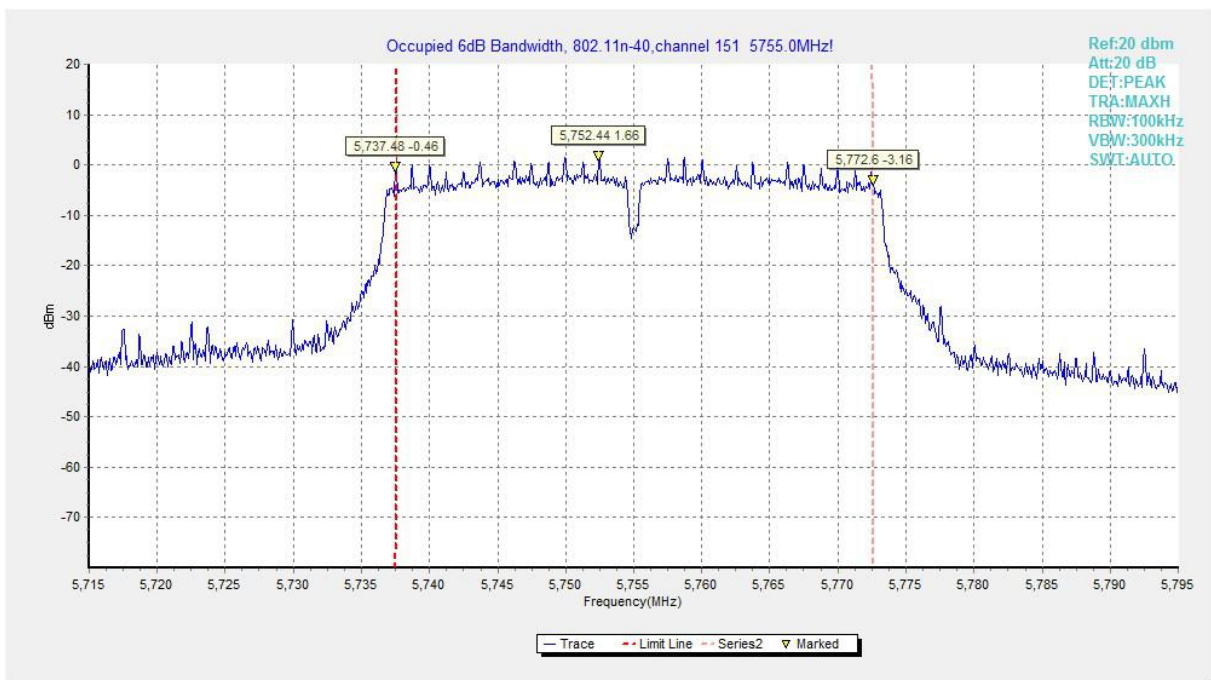


Fig. 10 Occupied 6dB Bandwidth (802.11n-HT40, Ch 151)

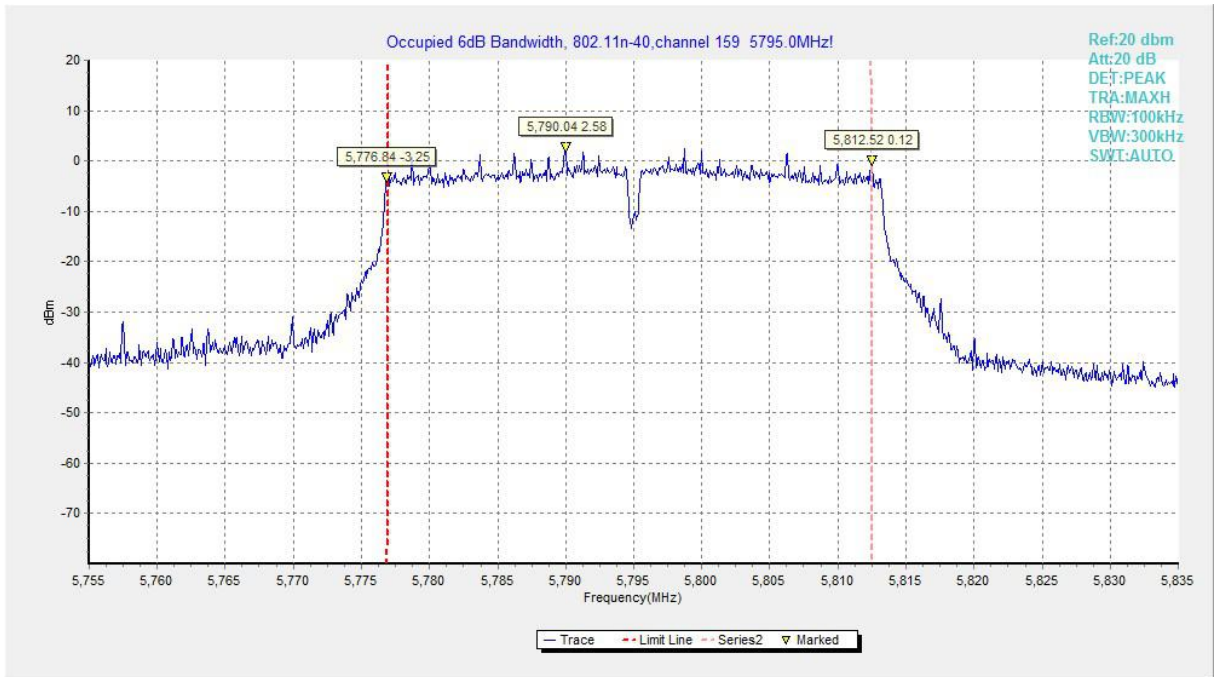


Fig. 11 Occupied 6dB Bandwidth (802.11n-HT40, Ch 159)

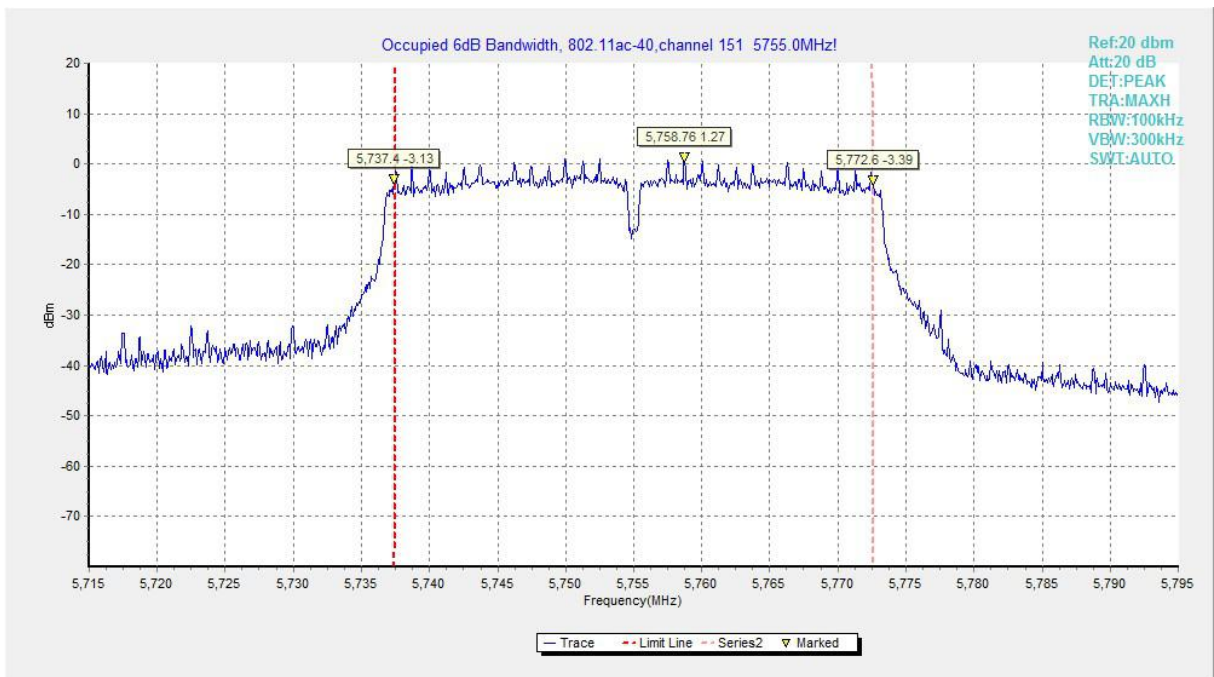


Fig. 12 Occupied 6dB Bandwidth (802.11ac-HT40, Ch 151)

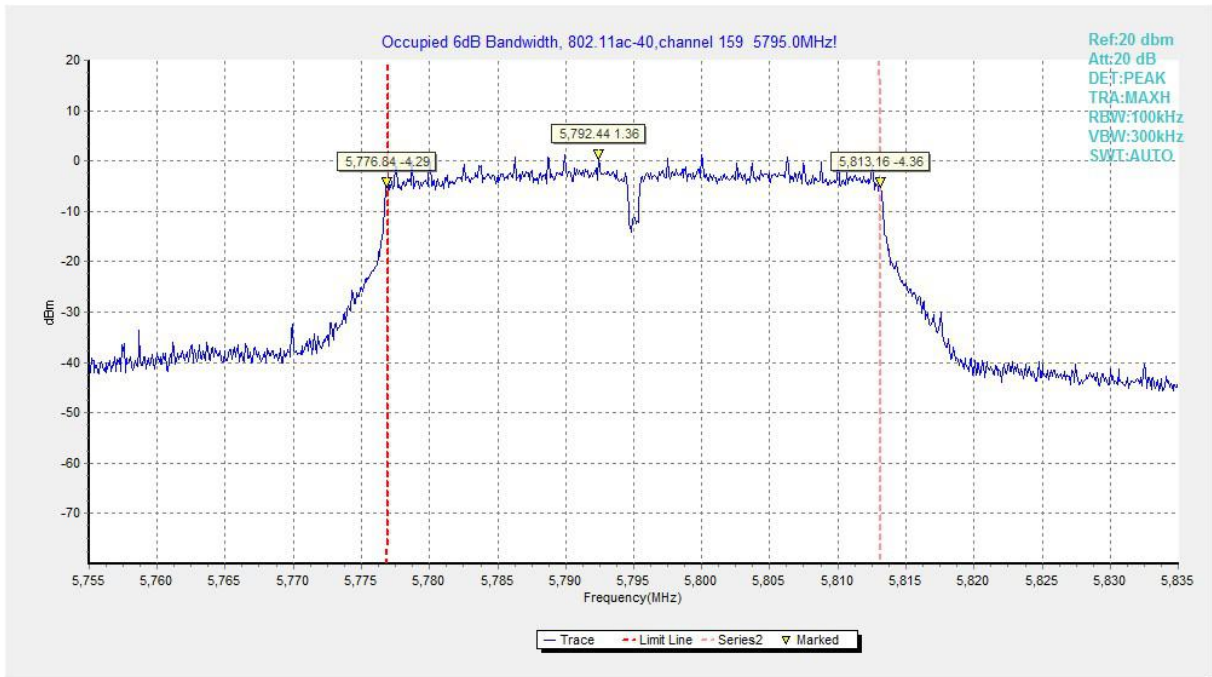


Fig. 13 Occupied 6dB Bandwidth (802.11ac-HT40, Ch 159)

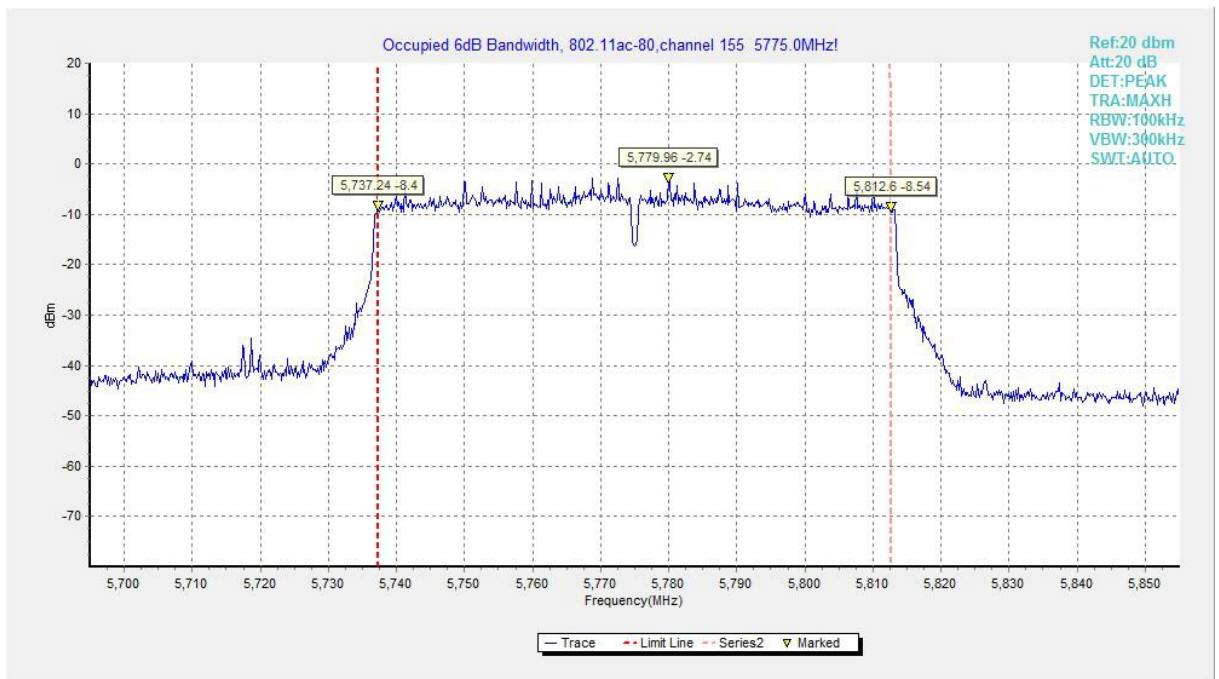


Fig. 14 Occupied 6dB Bandwidth (802.11ac-HT80, Ch 155)

A.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)).

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

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	PMea (dBuV/m)	Polarization	Limit (dBuV/m)	Margin (dBuV/m)
802.11a Channel 149							
17996.7	45.1	-25.5	46.7	23.9	V	54	8.9
17948.3	45	-25.5	46.7	23.8	V	54	9
17954.9	45	-25.5	46.7	23.8	H	54	9
17958.2	45	-25.5	46.7	23.8	V	54	9
17968.1	45	-25.5	46.7	23.8	H	54	9
17948.300	45.0	-25.5	43.4	27.102	H	54	9
802.11a Channel 157							
17970.3	45.1	-25.5	46.7	23.9	V	54	8.9
17980.2	45.1	-25.5	46.7	23.9	V	54	8.9
17982.4	45.1	-25.5	46.7	23.9	V	54	8.9
17983.5	45.1	-25.5	46.7	23.9	H	54	8.9
17986.8	45.1	-25.5	46.7	23.9	H	54	8.9
17987.9	45.1	-25.5	46.7	23.9	H	54	8.9
802.11a Channel 165							
17947.2	45.1	-25.5	46.7	23.9	V	54	8.9
17975.8	45.1	-25.5	46.7	23.9	V	54	8.9
17981.3	45.1	-25.5	46.7	23.9	H	54	8.9
17951.6	45	-25.5	46.7	23.8	V	54	9
17952.7	45	-25.5	46.7	23.8	H	54	9
17951.600	45.0	-25.5	43.4	27.102	H	54	9

802.11n-HT20

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	PMea (dBuV/m)	Polarization	Limit (dBuV/m)	Margin (dBuV/m)
802.11n Channel 149							
17948.3	45.1	-25.5	46.7	23.9	V	54	8.9
17969.2	45.1	-25.5	46.7	23.9	V	54	8.9
17952.7	45	-25.5	46.7	23.8	V	54	9
17961.5	45	-25.5	46.7	23.8	H	54	9
17970.3	45	-25.5	46.7	23.8	V	54	9
17983.500	44.9	-25.5	43.4	27.002	H	54	9.1
802.11n Channel 157							
17950.5	45.2	-25.5	46.7	24	H	54	8.8
17978	45.2	-25.5	46.7	24	H	54	8.8
17985.7	45.2	-25.5	46.7	24	H	54	8.8
17951.6	45.1	-25.5	46.7	23.9	H	54	8.9
17960.4	45.1	-25.5	46.7	23.9	H	54	8.9
17990.1	45	-25.5	46.7	23.8	V	54	9
802.11n Channel 165							
17959.3	45.2	-25.5	46.7	24	V	54	8.8
17964.8	45	-25.5	46.7	23.8	H	54	9
17981.3	45	-25.5	46.7	23.8	H	54	9
17989	45	-25.5	46.7	23.8	V	54	9
17992.3	45	-25.5	46.7	23.8	H	54	9
18000.000	44.9	-26.5	46.4	25.005	H	54	9.1

802.11n-HT40

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	PMea (dBuV/m)	Polarization	Limit (dBuV/m)	Margin (dBuV/m)
802.11n-HT40 Channel 151							
17995.6	45.4	-25.5	46.7	24.2	H	54	8.6
17957.1	45.1	-25.5	46.7	23.9	H	54	8.9
17975.8	45.1	-25.5	46.7	23.9	V	54	8.9
17947.2	45	-25.5	46.7	23.8	H	54	9
17956	45	-25.5	46.7	23.8	V	54	9
17973.600	45.0	-25.5	43.4	27.102	H	54	9
802.11n-HT40 Channel 159							
17952.7	45.4	-25.5	46.7	24.2	H	54	8.6
17954.9	45.1	-25.5	46.7	23.9	V	54	8.9
17995.6	45.1	-25.5	46.7	23.9	V	54	8.9
17996.7	45.1	-25.5	46.7	23.9	H	54	8.9
17975.8	45	-25.5	46.7	23.8	V	54	9
17946.1	44.9	-25.5	46.7	23.7	V	54	9.1

802.11ac-VHT20

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	PMea (dBuV/m)	Polarization	Limit (dBuV/m)	Margin (dBuV/m)
802.11ac-VHT20 Channel 149							
17957.1	45.1	-25.5	46.7	23.9	H	54	8.9
17978	45.1	-25.5	46.7	23.9	V	54	8.9
17997.8	45.1	-25.5	46.7	23.9	V	54	8.9
17947.2	45	-25.5	46.7	23.8	V	54	9
17979.1	45	-25.5	46.7	23.8	H	54	9
17995.600	44.9	-25.5	43.4	27.002	H	54	9.1
802.11ac-VHT20 Channel 157							
17963.7	45.3	-25.5	46.7	24.1	H	54	8.7
17987.9	45.1	-25.5	46.7	23.9	V	54	8.9
17993.4	45.1	-25.5	46.7	23.9	H	54	8.9
17995.6	45.1	-25.5	46.7	23.9	H	54	8.9
17943.9	45	-25.5	46.7	23.8	V	54	9
17948.3	45	-25.5	46.7	23.8	H	54	9
802.11ac-VHT20 Channel 165							
17982.4	45.1	-25.5	46.7	23.9	V	54	8.9
17957.1	45	-25.5	46.7	23.8	V	54	9
17991.2	45	-25.5	46.7	23.8	H	54	9
17997.8	45	-25.5	46.7	23.8	V	54	9
17951.6	44.9	-25.5	46.7	23.7	V	54	9.1
17995.600	44.9	-25.5	43.4	27.002	H	54	9.1

802.11ac-VHT40

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	PMea (dBuV/m)	Polarization	Limit (dBuV/m)	Magin (dBuV/m)
802.11ac-VHT40 Channel 151							
17983.5	45.2	-25.5	46.7	24	V	54	8.8
17996.7	45.1	-25.5	46.7	23.9	V	54	8.9
17952.7	45	-25.5	46.7	23.8	V	54	9
17963.7	45	-25.5	46.7	23.8	H	54	9
17991.2	45	-25.5	46.7	23.8	V	54	9
17946.100	44.9	-25.5	43.4	27.002	H	54	9.1
802.11ac-VHT40 Channel 159							
17987.9	45.2	-25.5	46.7	24	H	54	8.8
17996.7	45.1	-25.5	46.7	23.9	V	54	8.9
17952.7	45	-25.5	46.7	23.8	H	54	9
17957.1	45	-25.5	46.7	23.8	H	54	9
17963.7	45	-25.5	46.7	23.8	H	54	9
17960.400	44.9	-25.5	43.4	27.002	H	54	9.1

802.11ac-VHT80

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	PMea (dBuV/m)	Polarization	Limit (dBuV/m)	Magin (dBuV/m)
802.11ac-VHT80 Channel 155							
17984.6	45.1	-25.5	46.7	23.9	V	54	8.9
17997.8	45.1	-25.5	46.7	23.9	H	54	8.9
17965.9	45	-25.5	46.7	23.8	H	54	9
17971.4	45	-25.5	46.7	23.8	V	54	9
17983.5	45	-25.5	46.7	23.8	V	54	9
17985.7	45	-25.5	46.7	23.8	H	54	9

Peak Results:
802.11a

Frequency (MHz)	Result (dBUV/m)	Cable Loss (dB)	Antenna Factor	PMea (dBUV/m)	Polarization	Limit (dBUV/m)	Margin (dBUV/m)
802.11a Channel 149							
17962.6	57.1	-25.5	46.7	35.9	H	74	16.9
17986.8	56.9	-25.5	46.7	35.7	H	74	17.1
17964.8	56.5	-25.5	46.7	35.3	H	74	17.5
17898.8	56.4	-25.5	46.7	35.2	V	74	17.6
17952.7	56.3	-25.5	46.7	35.1	H	74	17.7
5724.7	58.7	-16.3	34.3	40.7	H	120	61.3
802.11a Channel 157							
17926.3	56.9	-25.5	46.7	35.7	H	74	17.1
17939.5	56.7	-25.5	46.7	35.5	H	74	17.3
17953.8	56.4	-25.5	46.7	35.2	H	74	17.6
17962.6	56.4	-25.5	46.7	35.2	V	74	17.6
17982.4	56.4	-25.5	46.7	35.2	V	74	17.6
17835	56.3	-25.5	46.7	35.1	V	74	17.7
802.11a Channel 165							
17990.1	56.9	-25.5	46.7	35.7	V	74	17.1
17965.9	56.8	-25.5	46.7	35.6	V	74	17.2
17985.7	56.7	-25.5	46.7	35.5	H	74	17.3
17968.1	56.6	-25.5	46.7	35.4	V	74	17.4
17938.4	56.3	-25.5	46.7	35.1	V	74	17.7
5857.2	58.1	-16.2	34.4	40	H	110	51.9

802.11n-HT20

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	PMea (dBuV/m)	Polarization	Limit (dBuV/m)	Margin (dBuV/m)
802.11n-HT20 Channel 149							
17956	56.8	-25.5	46.7	35.6	V	74	17.2
17954.9	56.7	-25.5	46.7	35.5	H	74	17.3
17981.3	56.7	-25.5	46.7	35.5	H	74	17.3
17983.5	56.4	-25.5	46.7	35.2	H	74	17.6
17879	56.3	-25.5	46.7	35.1	V	74	17.7
5724.2	56.3	-16.3	34.3	38.3	H	120	63.7
802.11n-HT20 Channel 157							
17964.8	56.7	-25.5	46.7	35.5	H	74	17.3
17956	56.5	-25.5	46.7	35.3	H	74	17.5
17990.1	56.5	-25.5	46.7	35.3	V	74	17.5
17866.9	56.4	-25.5	46.7	35.2	H	74	17.6
17961.5	56.3	-25.5	46.7	35.1	V	74	17.7
17861.4	56.2	-25.5	46.7	35	V	74	17.8
802.11n-HT20 Channel 165							
17992.3	57.3	-25.5	46.7	36.1	H	74	16.7
17941.7	56.6	-25.5	46.7	35.4	H	74	17.4
17981.3	56.6	-25.5	46.7	35.4	H	74	17.4
17996.7	56.5	-25.5	46.7	35.3	V	74	17.5
17857	56.4	-25.5	46.7	35.2	V	74	17.6
5853.2	56.2	-16.2	34.4	38.1	H	114	57.8

802.11n-HT40

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	PMea (dBuV/m)	Polarization	Limit (dBuV/m)	Margin (dBuV/m)
802.11n-HT40 Channel 151							
17855.9	57.4	-25.5	46.7	36.2	H	74	16.6
17992.3	56.9	-25.5	46.7	35.7	H	74	17.1
17948.3	56.8	-25.5	46.7	35.6	H	74	17.2
17931.8	56.7	-25.5	46.7	35.5	V	74	17.3
17991.2	56.7	-25.5	46.7	35.5	V	74	17.3
5723	60.4	-16.3	34.3	42.4	V	119	58.6
802.11n-HT40 Channel 159							
17953.8	57.7	-25.5	46.7	36.5	V	74	16.3
17996.7	56.9	-25.5	46.7	35.7	V	74	17.1
17964.8	56.7	-25.5	46.7	35.5	H	74	17.3
17987.9	56.7	-25.5	46.7	35.5	V	74	17.3
17985.7	56.6	-25.5	46.7	35.4	H	74	17.4
5850.2	53.7	-16.2	34.4	35.6	H	122	68.3

802.11ac-VHT20

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	PMea (dBuV/m)	Polarization	Limit (dBuV/m)	Margin (dBuV/m)
802.11ac-VHT20 Channel 149							
17984.6	58.4	-25.5	46.7	37.2	V	74	15.6
17971.4	56.9	-25.5	46.7	35.7	H	74	17.1
17941.7	56.8	-25.5	46.7	35.6	H	74	17.2
17851.5	56.6	-25.5	46.7	35.4	H	74	17.4
17810.8	56.5	-25.5	46.7	35.3	V	74	17.5
5724.9	57	-16.3	34.3	39	H	120	63
802.11ac-VHT20 Channel 157							
17901	56.5	-25.5	46.7	35.3	V	74	17.5
17974.7	56.5	-25.5	46.7	35.3	V	74	17.5
17987.9	56.3	-25.5	46.7	35.1	V	74	17.7
17935.1	56.2	-25.5	46.7	35	H	74	17.8
17976.9	56.2	-25.5	46.7	35	H	74	17.8
17780	56.1	-25.5	46.7	34.9	V	74	17.9
802.11ac-VHT20 Channel 165							
17971.4	57.3	-25.5	46.7	36.1	H	74	16.7
17943.9	56.7	-25.5	46.7	35.5	V	74	17.3
17953.8	56.7	-25.5	46.7	35.5	H	74	17.3
17587.5	56.5	-25.7	46	36.3	V	74	17.5
17921.9	56.5	-25.5	46.7	35.3	H	74	17.5
5850.9	53.6	-16.2	34.4	35.5	V	122	68.4

802.11ac-HT40

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	PMea (dBuV/m)	Polarization	Limit (dBuV/m)	Magin (dBuV/m)
802.11ac-VHT40 Channel 151							
17991.2	57	-25.5	46.7	35.8	V	74	17
17931.8	56.7	-25.5	46.7	35.5	V	74	17.3
17984.6	56.7	-25.5	46.7	35.5	H	74	17.3
17950.5	56.6	-25.5	46.7	35.4	V	74	17.4
17909.8	56.5	-25.5	46.7	35.3	H	74	17.5
5724.6	59.5	-16.3	34.3	41.5	H	120	60.5
802.11ac-VHT40 Channel 159							
17947.2	56.7	-25.5	46.7	35.5	V	74	17.3
17928.5	56.6	-25.5	46.7	35.4	H	74	17.4
17959.3	56.6	-25.5	46.7	35.4	H	74	17.4
17972.5	56.6	-25.5	46.7	35.4	V	74	17.4
17980.2	56.6	-25.5	46.7	35.4	H	74	17.4
5850.5	53.9	-16.2	34.4	35.8	H	122	68.1

802.11ac-HT80

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	PMea (dBuV/m)	Polarization	Limit (dBuV/m)	Magin (dBuV/m)
802.11ac-VHT80 Channel 155							
17871.3	56.4	-25.5	46.7	35.2	H	74	17.6
17930.7	56.3	-25.5	46.7	35.1	H	74	17.7
17987.9	56.3	-25.5	46.7	35.1	V	74	17.7
17849.3	56.2	-25.5	46.7	35	H	74	17.8
17902.1	56.1	-25.5	46.7	34.9	V	74	17.9
17905.4	56.1	-25.5	46.7	34.9	V	74	17.9

Conclusion: PASS

A.6. Band Edges Compliance

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:

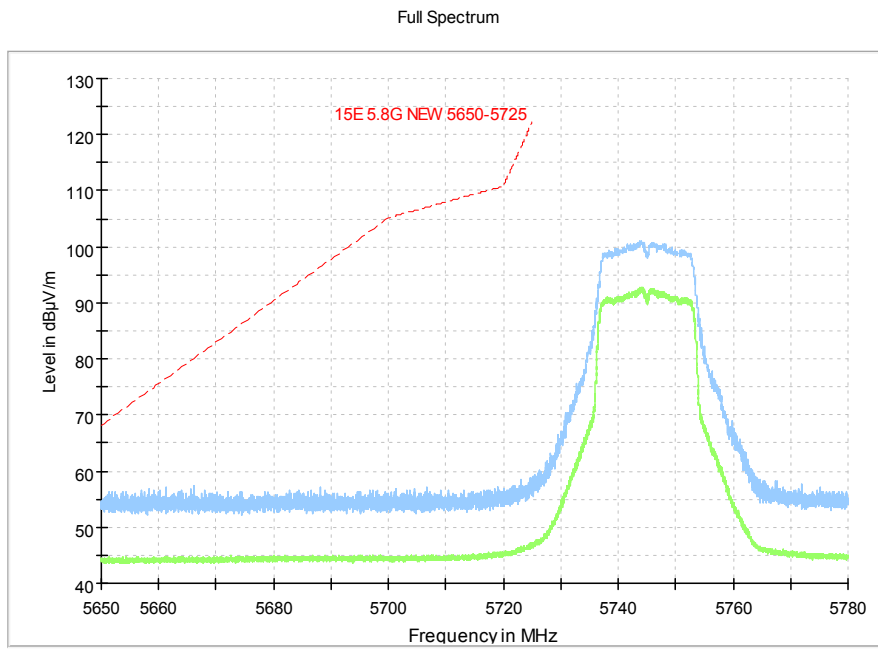


Fig. 15 Band Edges (802.11a, 5745MHz)

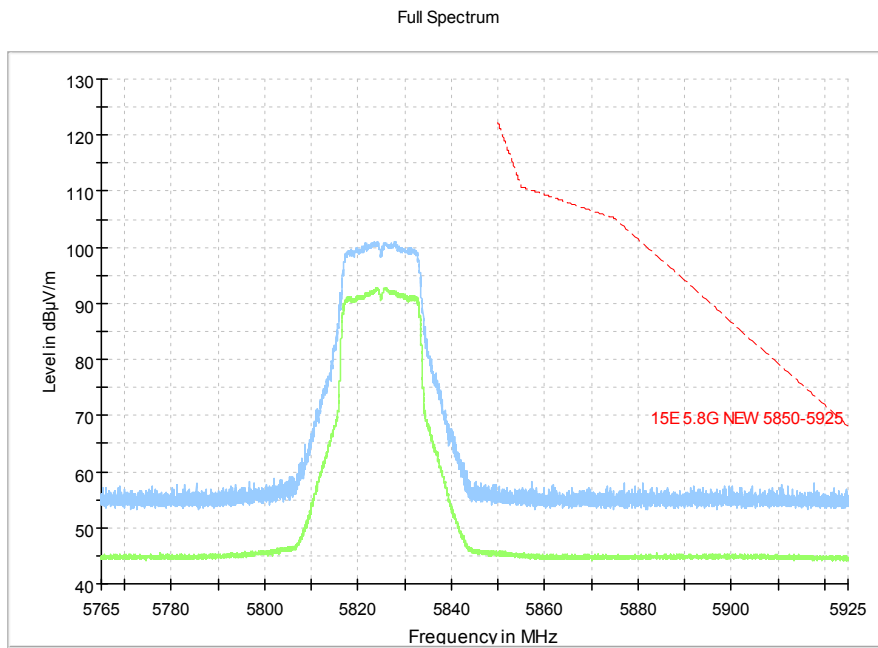


Fig. 16 Band Edges (802.11a, 5825MHz)

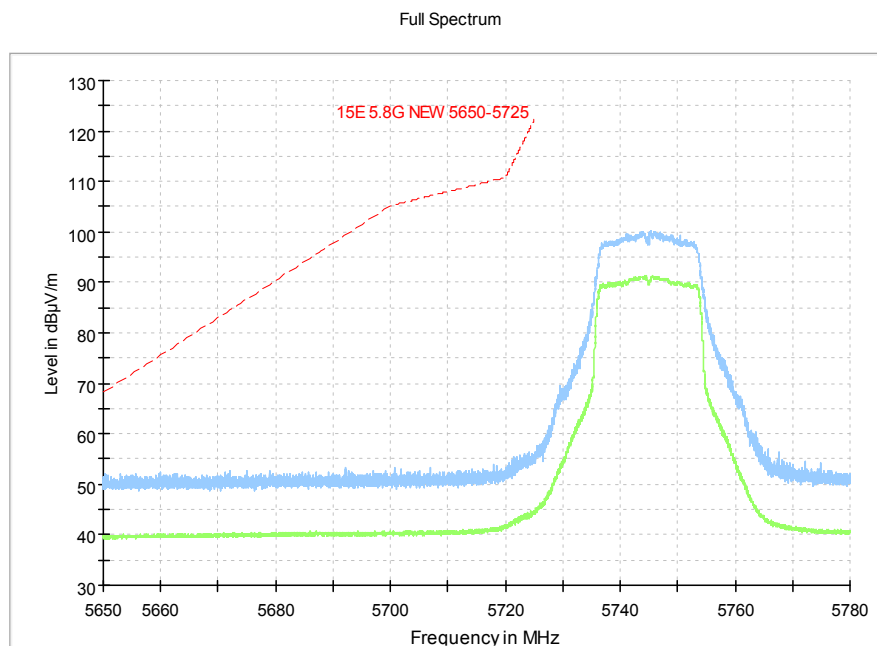


Fig. 17 Band Edges (802.11n-HT20, 5745MHz)

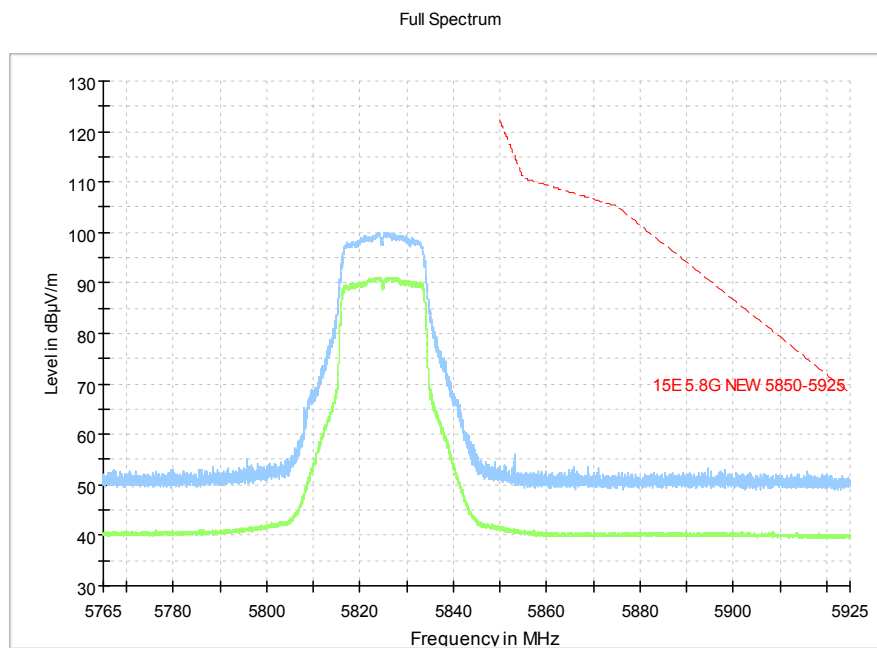


Fig. 18 Band Edges (802.11n-HT20, 5825MHz)

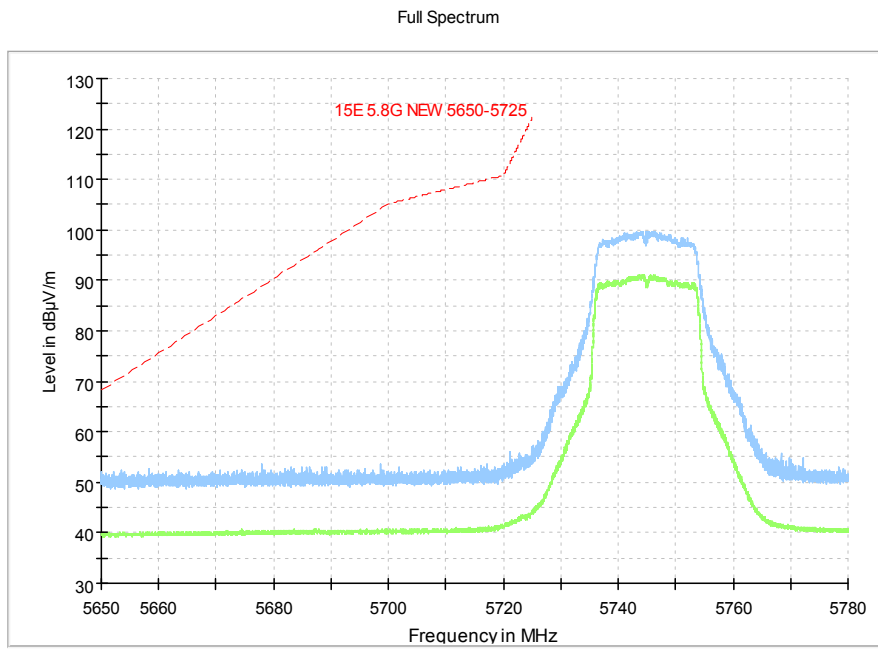


Fig. 19 Band Edges (802.11ac-HT20, 5745MHz)

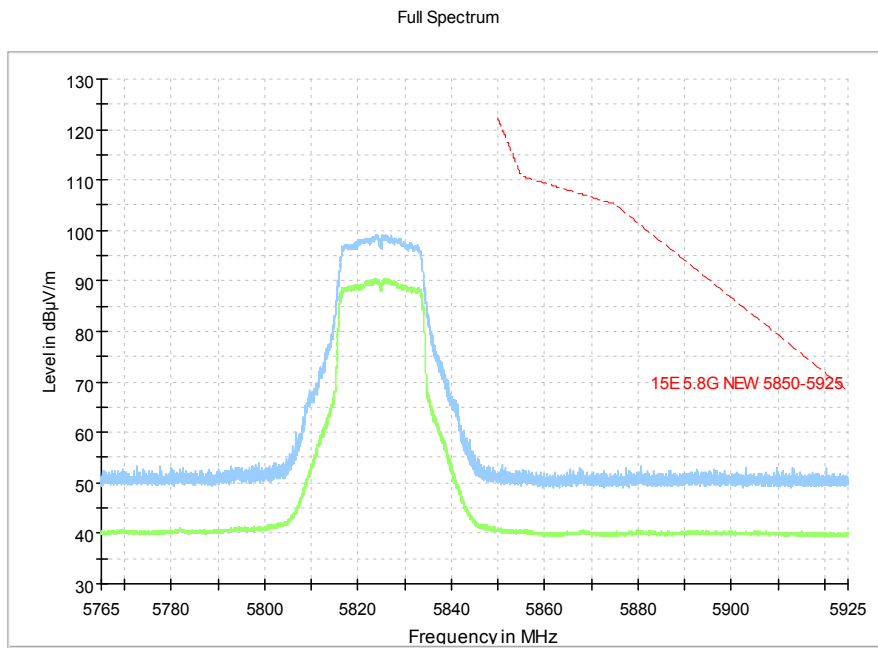


Fig. 20 Band Edges (802.11ac-HT20, 5825MHz)

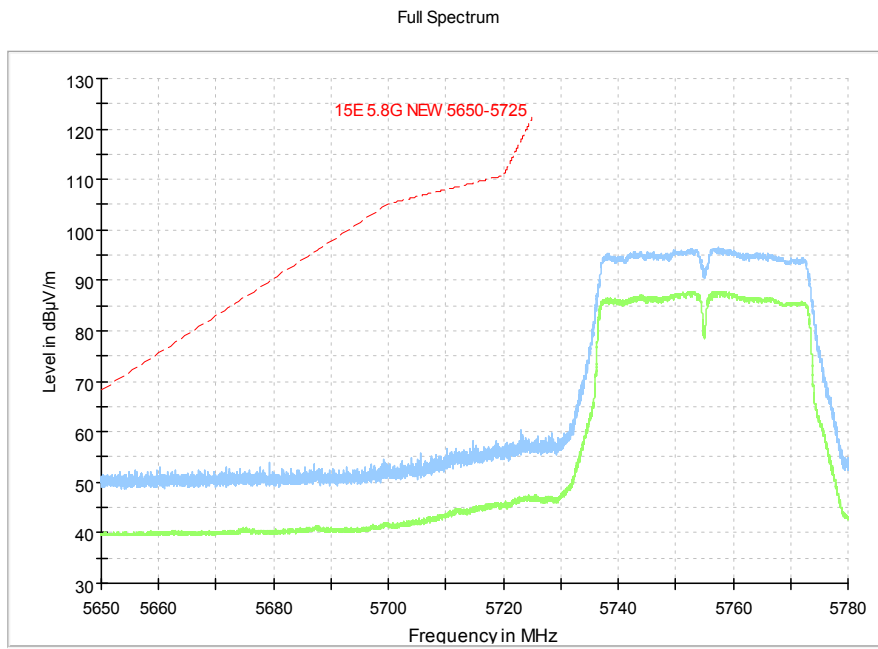


Fig. 21 Band Edges (802.11n-HT40, 5755MHz)

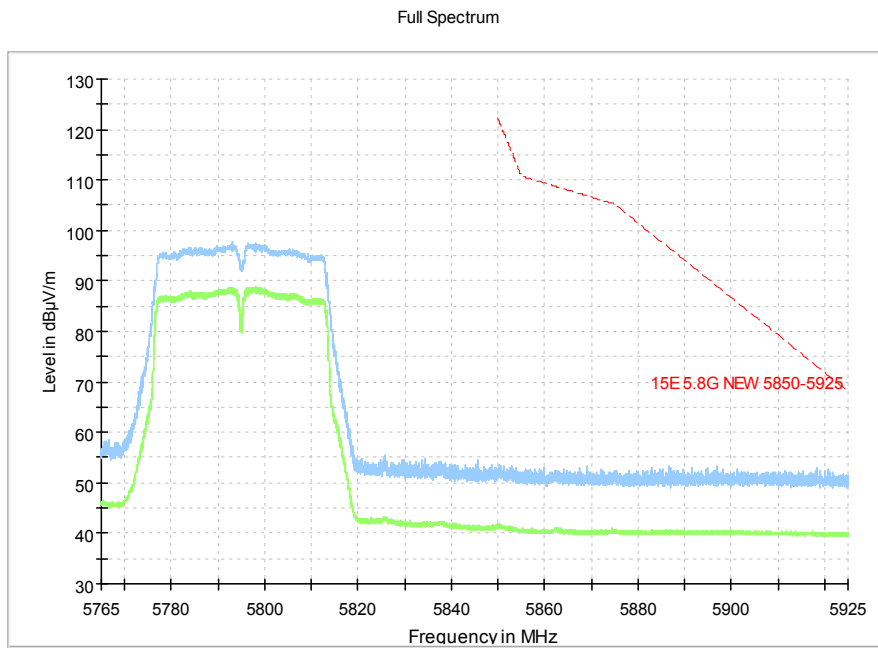


Fig. 22 Band Edges (802.11n-HT40, 5795MHz)

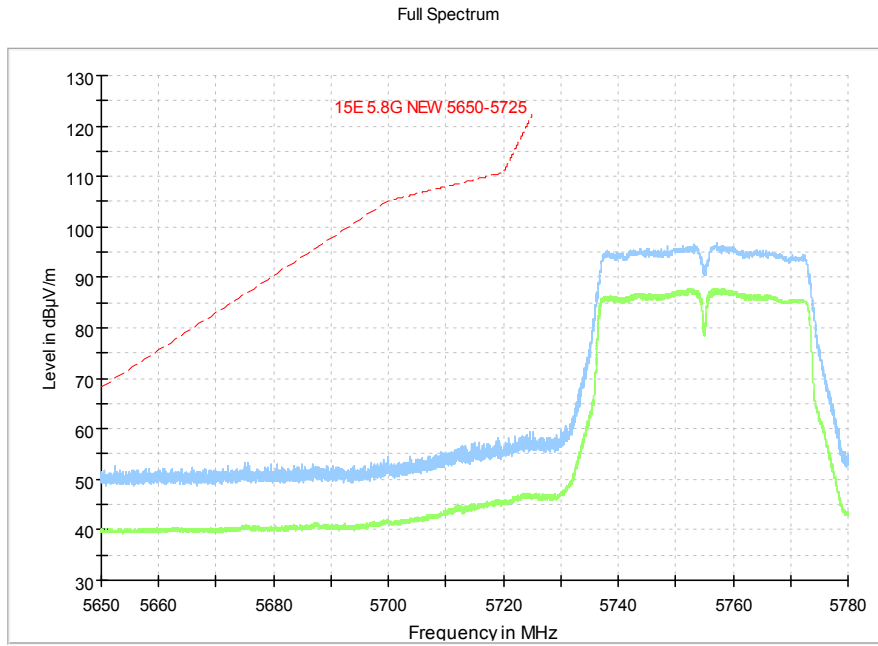


Fig. 23 Band Edges (802.11ac-HT40, 5755MHz)

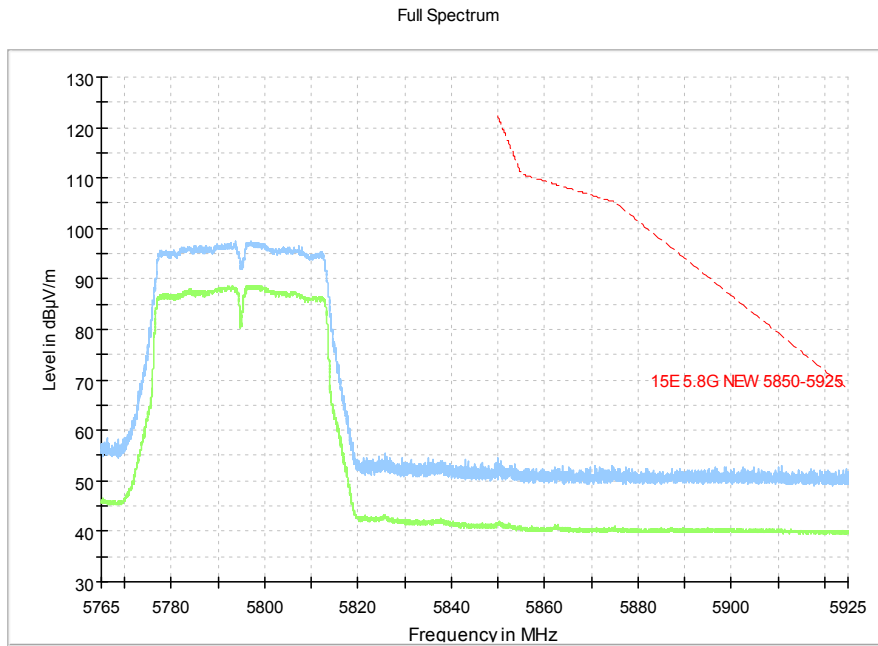


Fig. 24 Band Edges (802.11ac-HT40, 5795MHz)

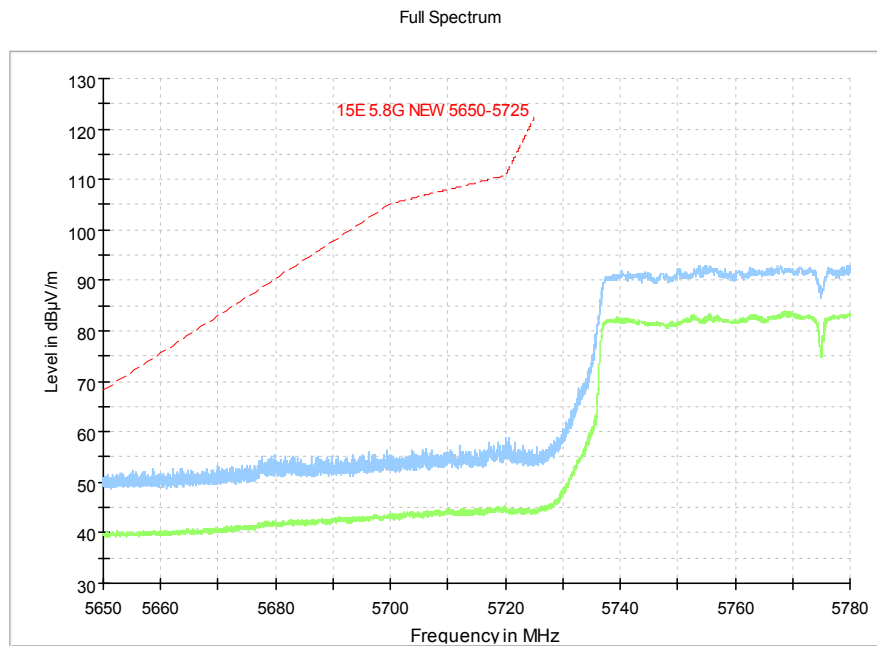


Fig. 25 Band Edges (802.11ac-HT80, 5775MHz)

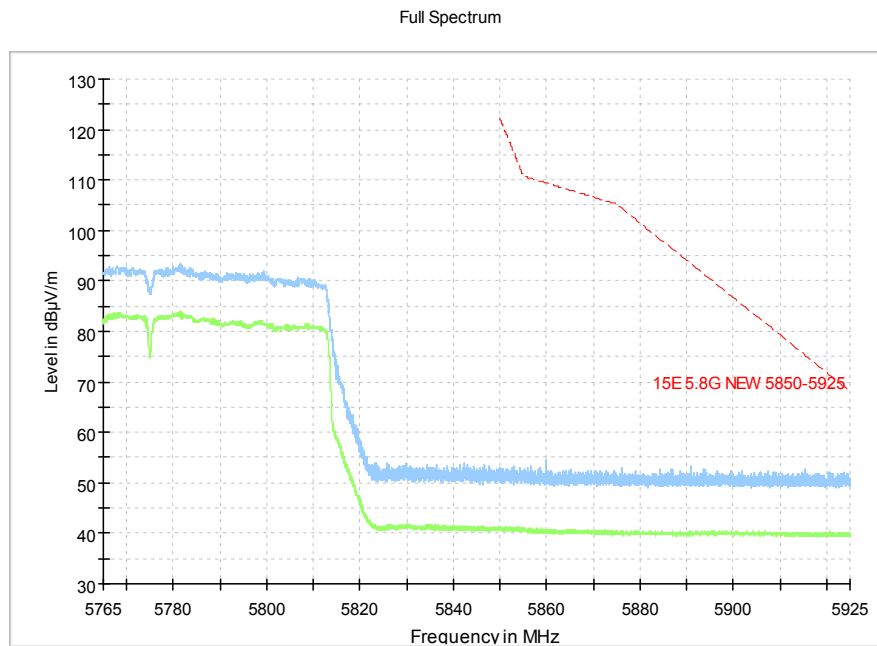


Fig. 26 Band Edges (802.11ac-HT80, 5775MHz)

A.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	
0.15 to 0.5	66 to 56	802.11a	P
0.5 to 5	56	Fig. 27	
5 to 30	60		

WLAN (Average Limit)

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

The measurement is made according to ANSI C63.10 .

Conclusion: **PASS**

Test graphs as below:

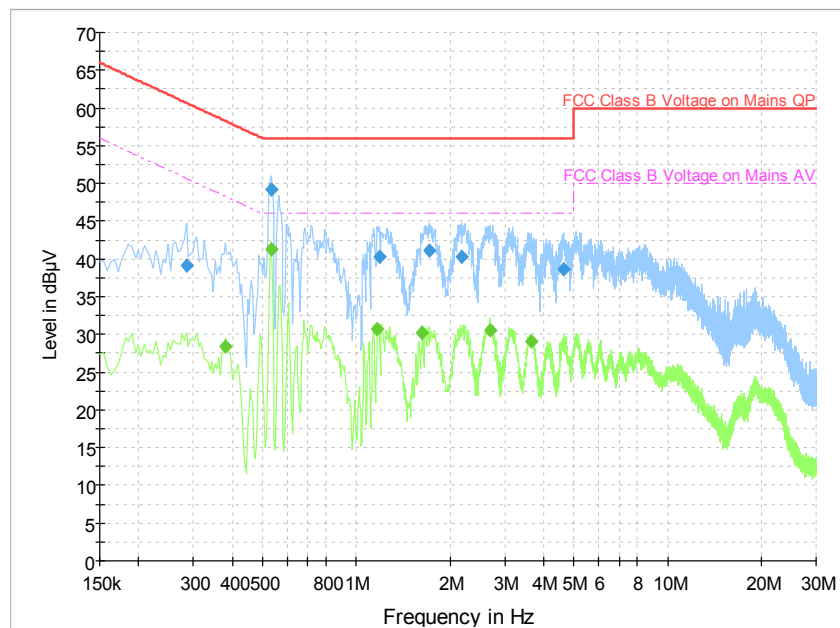


Fig. 27 AC Powerline Conducted Emission-802.11a

Final Result 1

Frequency (MHz)	QuasiPeak (dB μ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.285000	39.1	L1	20.0	21.6	60.7
0.532500	49.2	L1	20.1	6.8	56.0
1.185000	40.2	L1	19.8	15.8	56.0
1.711500	41.1	L1	20.0	14.9	56.0
2.184000	40.3	L1	20.1	15.7	56.0
4.641000	38.6	L1	20.7	17.4	56.0

Final Result 2

Frequency (MHz)	Average (dB μ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.379500	28.4	L1	20.1	19.9	48.3
0.532500	41.3	L1	20.1	4.7	46.0
1.171500	30.7	L1	19.8	15.3	46.0
1.630500	30.2	N	19.9	15.8	46.0
2.683500	30.5	L1	20.2	15.5	46.0
3.642000	29.0	L1	20.5	17.0	46.0

ANNEX B: Accreditation Certificate

<p>United States Department of Commerce National Institute of Standards and Technology</p> 	
<hr/> <p>Certificate of Accreditation to ISO/IEC 17025:2005</p> <hr/>	
<p>NVLAP LAB CODE: 600118-0</p>	
<p>Telecommunication Technology Labs, CAICT Beijing China</p>	
<p><i>is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for:</i></p>	
<p>Electromagnetic Compatibility & Telecommunications</p>	
<p><i>This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. 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></p>	
<hr/> <p>2019-09-26 through 2020-09-30 <i>Effective Dates</i></p>	 <hr/> <p><i>[Signature]</i> For the National Voluntary Laboratory Accreditation Program</p>

*** END OF REPORT BODY ***