FCC PART 15C
TEST REPORT
No. I20Z61660-IOT08

for

Lenovo (Shanghai) Electronics Technology Co., Ltd.

Portable Tablet Computer

Lenovo TB-J606F

FCC ID : O57TBJ606F

with

Hardware Version: Lenovo TB-J606F

Software Version: TB-J606F_RF01_200927

Issued Date: 2020-11-02

Note:

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of CTTL.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S.Government.

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: cttl_terminals@caict.ac.cn, website: www.caict.ac.cn

REPORT HISTORY

Report Number	Revision	Description	Issue Date
I20Z61660-IOT08	Rev.0	1st edition	2020-11-02
I20Z61660-IOT08	Rev.1	Add FCCID on P.8	2020-11-02

CONTENTS

1. TEST LATORATORY

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(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

Radiated testing Location: CTTL(BDA)

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

1.3. TestingEnvironment

Normal Temperature: 15-35℃

Extreme Temperature: -20/+55℃

Relative Humidity: 20-75%

1.4. Project date

Testing Start Date: 2020-09-23

Testing End Date: 2020-11-01

1.5. Signature

Feng Aiyu

(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:	Lenovo (Shanghai) Electronics Technology Co., Ltd.
Address:	Section 304-305, Building No. 4, # 222, Meiyue Road, China (Shanghai) Pilot Free Trade Zone
City:	Shanghai
Postal Code:	/
Country:	CHINA
Contact:	Spring Zhou
Telephone	+86 18116118237
E-mail:	zhoucb1@lenovo.com

2.2. Manufacturer Information

Company Name:	Lenovo PC HK Limited
Address:	23/F, Lincoln House, Taikoo Place 979 King's Road, Quarry Bay, Hong Kong, P.R.China
City:	Hong Kong
Postal Code:	/
Country:	CHINA
Contact:	Spring Zhou
Telephone	+86 18116118237
E-mail:	zhoucb1@lenovo.com

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

3.1. About EUT

Description	Portable Tablet Computer
Model name	Lenovo TB-J606F
FCC ID	O57TBJ606F
WLAN Frequency Range	ISM Band: 5725MHz~5850MHz
Type of modulation	OFDM
Voltage	3.8 V

Note: Photographs of EUT are shown in ANNEX C of this test report. Components list, please refer to documents of the manufacturer; it is also included in the original test record of Telecommunication Metrology Center of MIIT of People's Republic of China.

3.2. Internal Identification of EUT used during the test

EUT ID*	IMEI	HW Version	SW Version
EUT1	HA16H66H	Lenovo TB-J606F	TB-J606F_RF01_200927
EUT2	HA16HRZ7	Lenovo TB-J606F	TB-J606F_RF01_200927

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

3.1. Internal Identification of AE used during the test

AE ID*	Description		
AE1-1	Charger	/	MC-201
AE1-2	Charger	/	MC-201
AE2-1	Charger	/	MC-202
AE2-2	Charger	/	MC-202
AE3-1	Charger	/	MC-203
AE3-2	Charger	/	MC-203
AE8	USB Cable	/	/
AE9	Battery	/	SCUD

AE1-1

Model	MC-201
Manufacturer	Acbel
Length of cable	/

AE1-2

Model	MC-201
Manufacturer	Chenyang
Length of cable	/

AE2-1

Model	MC-202
Manufacturer	Acbel
Length of cable	/

AE2-2

Model	MC-202
Manufacturer	Chenyang
Length of cable	/

AE3-1

Model	MC-203
Manufacturer	Acbel
Length of cable	/

AE3-2

Model	MC-203
Manufacturer	Chenyang
Length of cable	/

AE8

Model	/
Manufacturer	/
Length of cable	/

AE9

Model	L20D2P32
Manufacturer	SCUD
Capacitance	7500mAh
Nominal voltage	3.86V

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

3.2. General Description

The Equipment under Test (EUT) is a model of Portable Tablet Computer with Bluetooth, WLAN with integrated antenna and inbuilt battery..

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/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℃
Voltage	3.8 V
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	2021-05-15
2	LISN	ENV216	101200	Rohde & Schwarz	1 year	2021-08-03
3	Test Receiver	ESCI	100344	Rohde & Schwarz	1 year	2021-03-15
4	Shielding Room	S81	/	ETS-Lindgren	/	/
5	Attenuator	K40	/	Rosenberger	/	/

Radiated emission test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Period	Calibration Due date
1	Test Receiver	ESU26	100376	Rohde & Schwarz	1 year	2021-12-30
2	BiLog Antenna	VULB9163	514	Schwarzbeck	3 years	2021-01-03
3	Dual-Ridge Waveguide Horn Antenna	3116	2663	ETS-Lindgren	3 years	2021-05-31
4	EMI Antenna	3117	00139065	ETS-Lindgren	3 Years	2021-11-15
5	Spectrum Analyzer	FSV40	101047	Rohde & Schwarz	1 year	2021-07-22

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)
30MHz ≤ f ≤ 2GHz	1.22
2GHz ≤ f ≤3.6GHz	1.22
3.6GHz ≤ f ≤8GHz	1.22
8GHz ≤ f ≤12.75GHz	1.51
12.75GHz ≤ f ≤26GHz	1.51
26GHz ≤ f ≤40GHz	1.59

Radiated (k=2)

Frequency Range	Uncertainty(dB)
9kHz-30MHz	/
30MHz ≤ f ≤ 1GHz	5.40
1GHz ≤ f ≤18GHz	4.32
18GHz ≤ f ≤40GHz	5.26

8.6. AC Power-line Conducted Emission

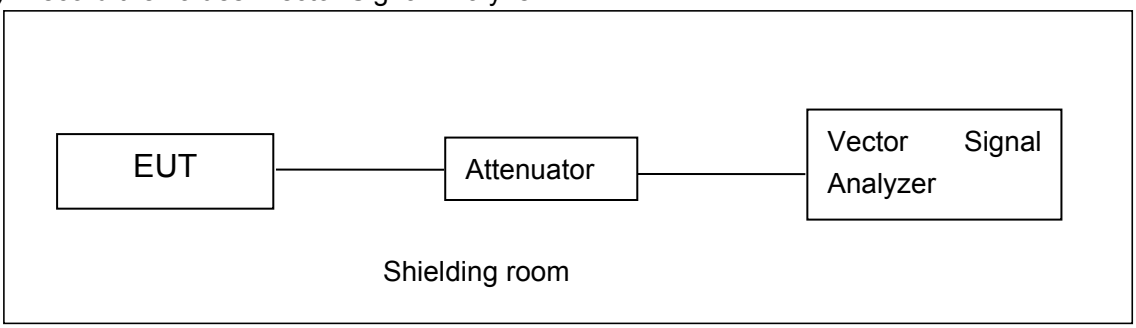
Measurement Uncertainty : 3.08dB,k=2

ANNEX A: MEASUREMENT RESULTS

A.1. Measurement Method

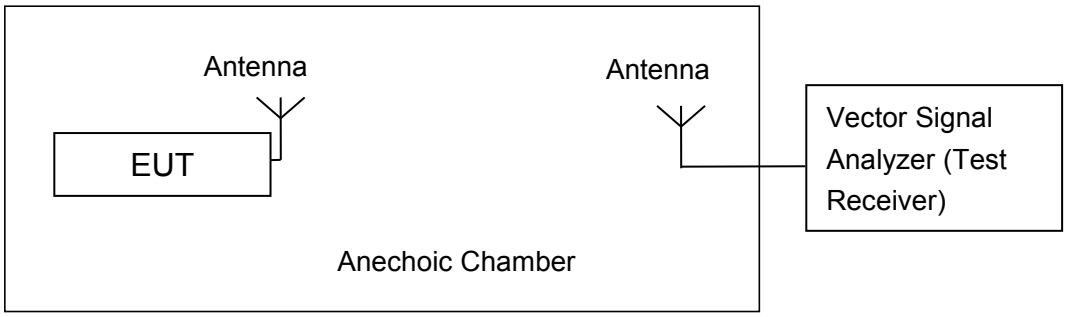
A.1.1. Conducted Measurements

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,
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.

A.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	15.93	16.40	16.79

802.11n-HT20 mode

Mode	Test Result (dBm)		
	5745MHz (Ch149)	5785MHz (Ch157)	5825MHz(Ch165)
802.11n(20MHz)	14.65	15.25	15.47

802.11ac-HT20 mode

Mode	Test Result (dBm)		
	5745MHz (Ch149)	5785MHz (Ch157)	5825MHz(Ch165)
802.11ac(20MHz)	15.72	16.16	16.46

802.11n-HT40 mode

Mode	Test Result (dBm)	
	5755MHz (Ch151)	5795MHz(Ch159)
802.11n(40MHz)	16.16	16.59

802.11ac-HT40 mode

Mode	Test Result (dBm)	
	5755MHz (Ch151)	5795MHz(Ch159)
802.11ac(40MHz)	15.38	15.95

802.11ac-HT80 mode

Mode	Test Result (dBm)
	5775MHz (Ch155)
802.11ac(80MHz)	15.85

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

Measurement Results:

Mode	Channel	Power Spectral Density (dBm/500kHz)	Conclusion
802.11a	149	9.47	P
	157	9.41	P
	165	9.19	P
802.11n HT20	149	10.02	P
	157	9.88	P
	165	9.58	P
802.11ac HT20	149	10.33	P
	157	10.76	P
	165	9.98	P
802.11n HT40	151	5.61	P
	159	5.59	P
802.11ac HT40	151	7.46	P
	159	7.35	P
802.11ac HT80	155	4.02	P

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

Measurement Result:

Mode	Channel	Occupied 6dB Bandwidth (KHz)		conclusion
802.11a	149	Fig.1	15.55	P
	157	Fig.2	15.65	P
	165	Fig.3	15.55	P
802.11n HT20	149	Fig.4	16.80	P
	157	Fig.5	16.50	P
	165	Fig.6	16.75	P
802.11ac HT20	149	Fig.7	16.50	P
	157	Fig.8	16.55	P
	165	Fig.9	16.50	P
802.11n HT40	151	Fig.10	35.92	P
	159	Fig.11	35.36	P
802.11ac HT40	151	Fig.12	35.36	P
	159	Fig.13	35.28	P
802.11ac HT80	155	Fig.14	75.20	P

Conclusion: PASS

Test graphs as below:

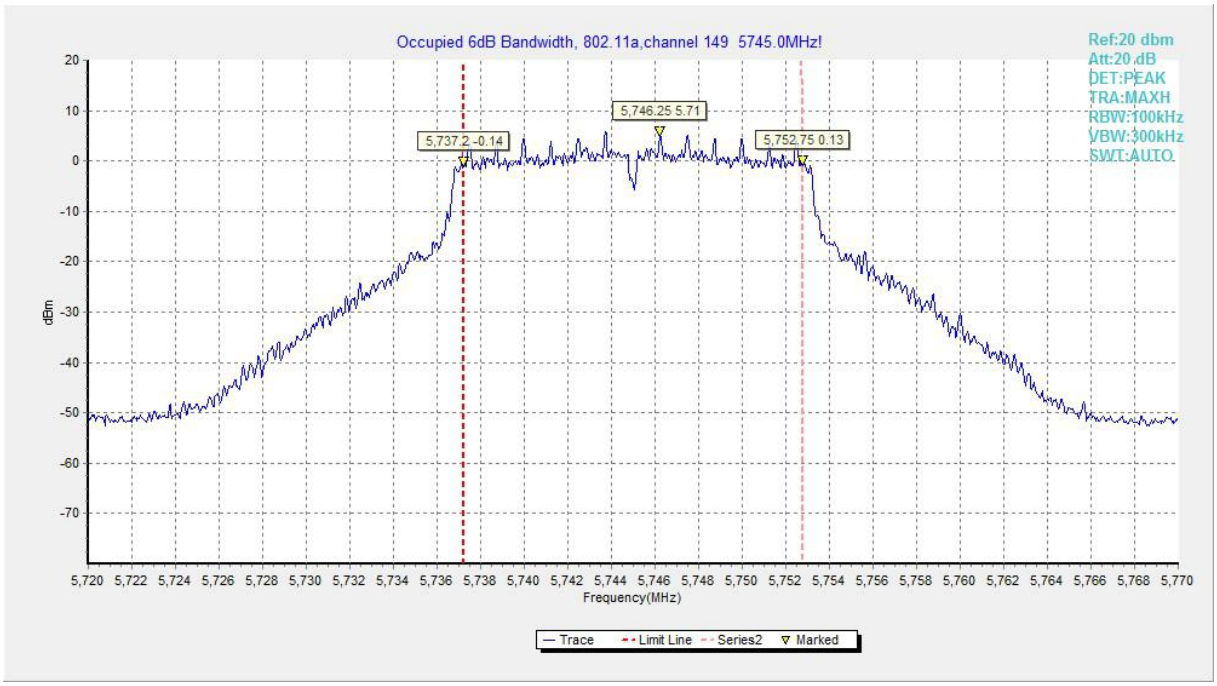


Fig. 1 Occupied 6dB Bandwidth (802.11a, Ch 149)

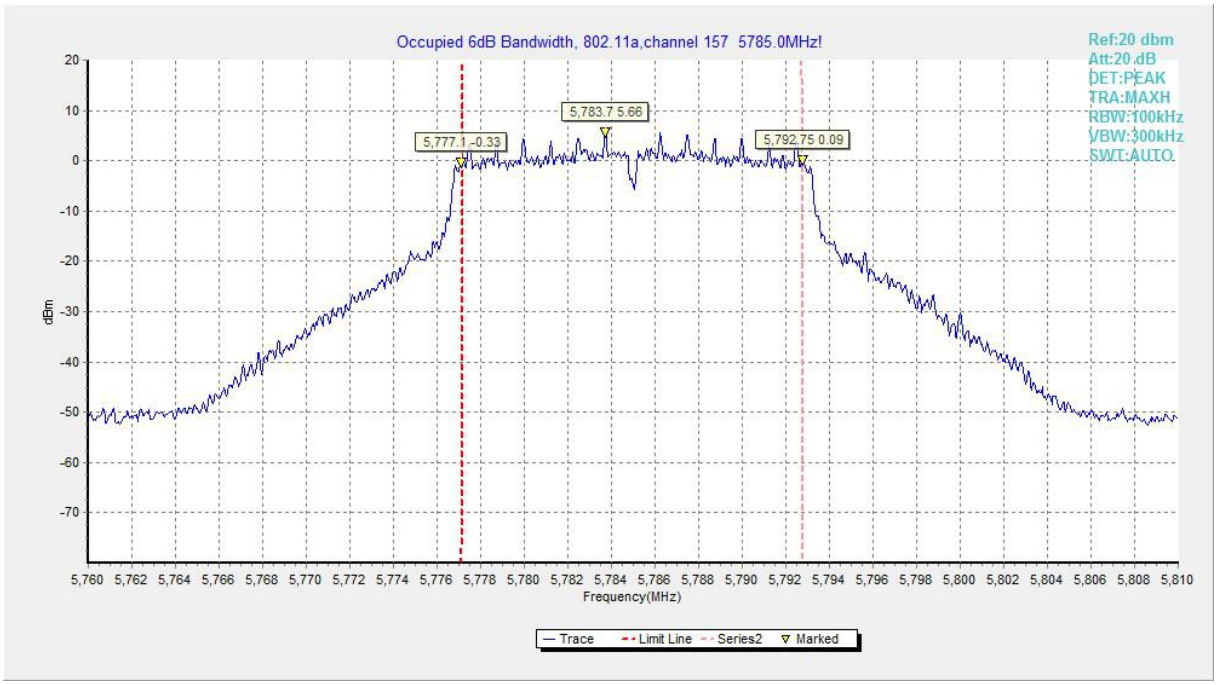


Fig. 2 Occupied 6dB Bandwidth (802.11a, Ch 157)

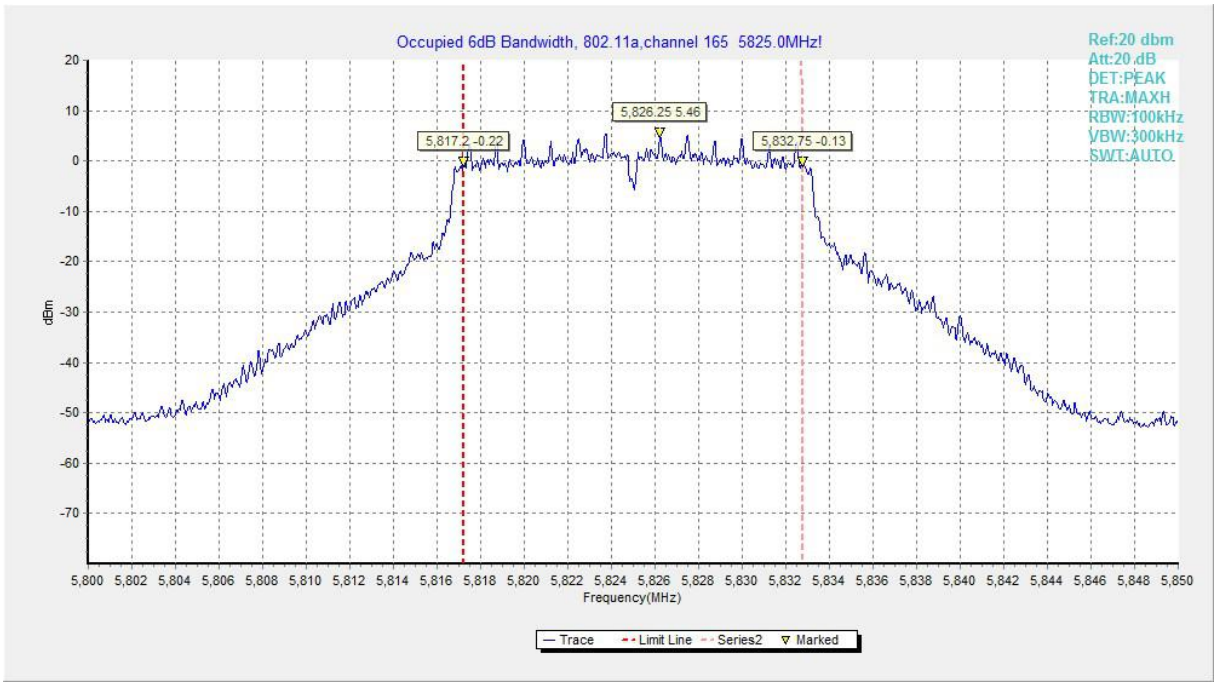


Fig. 3 Occupied 6dB Bandwidth (802.11a, Ch 165)

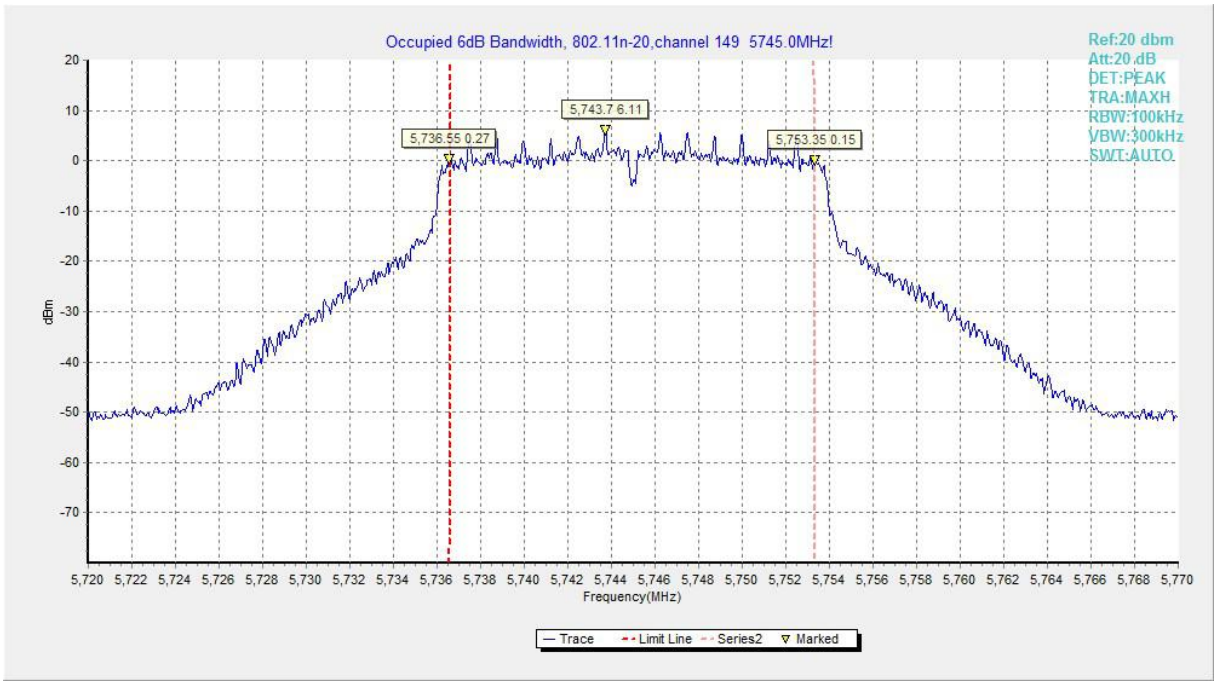


Fig. 4 Occupied 6dB Bandwidth (802.11n-HT20, Ch 149)

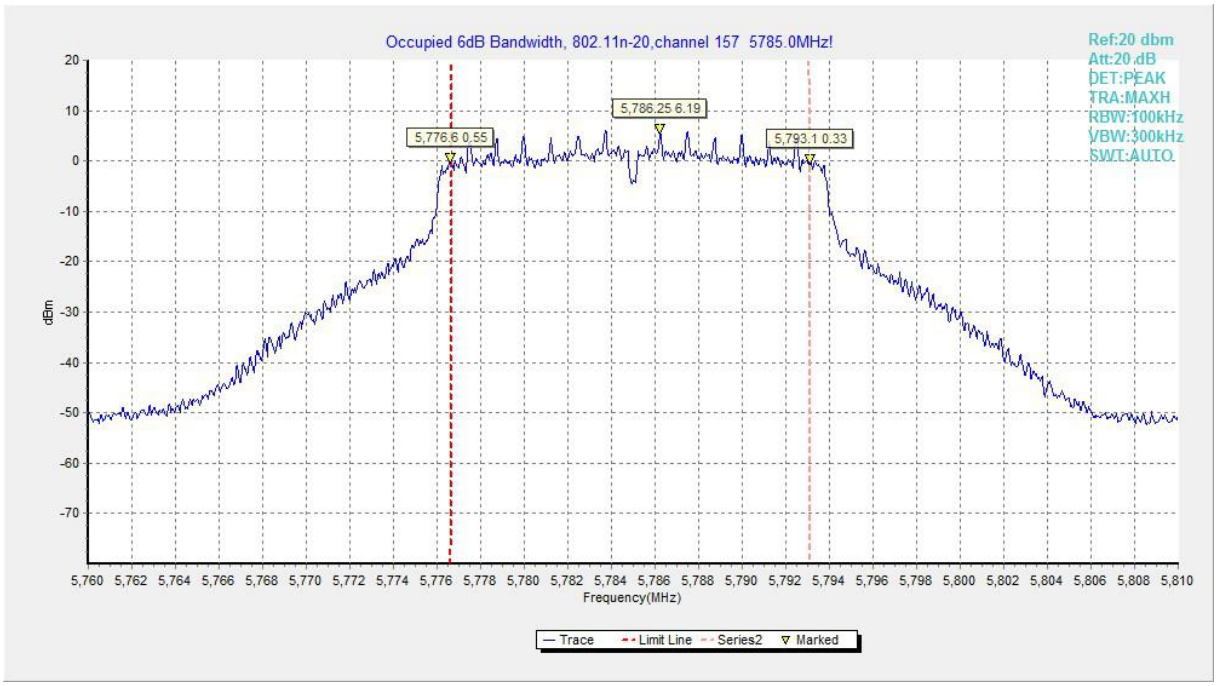


Fig. 5 Occupied 6dB Bandwidth (802.11n-HT20, Ch 157)

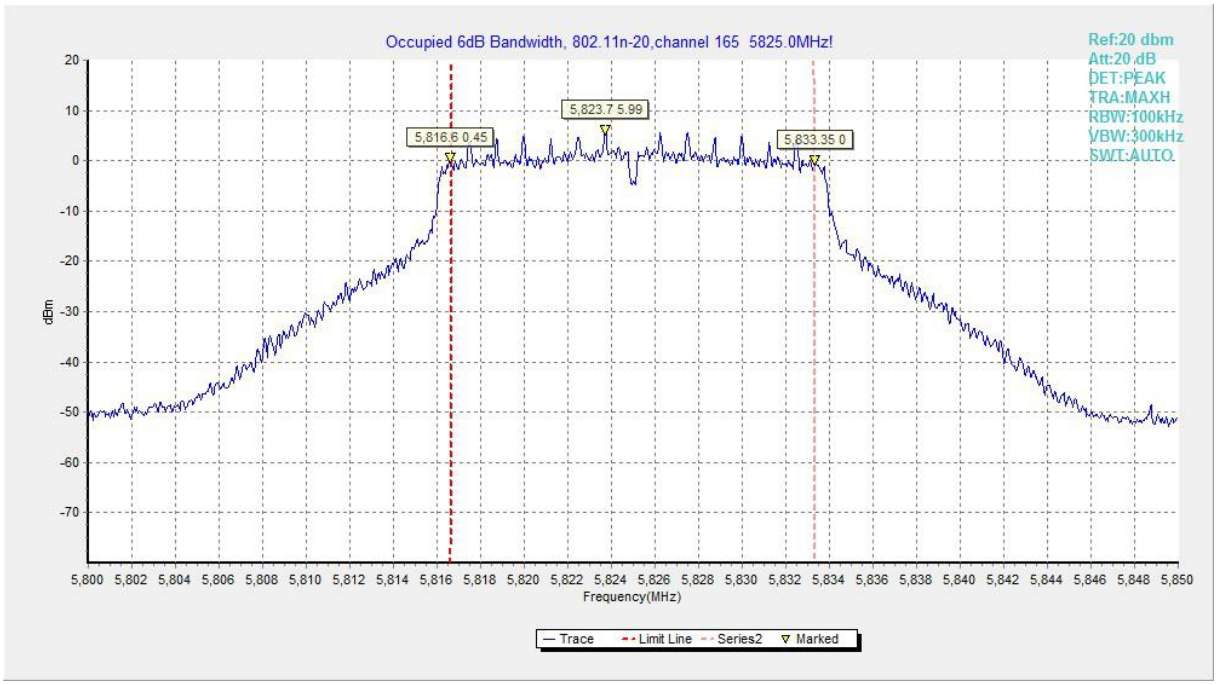


Fig. 6 Occupied 6dB Bandwidth (802.11n-HT20, Ch 165)

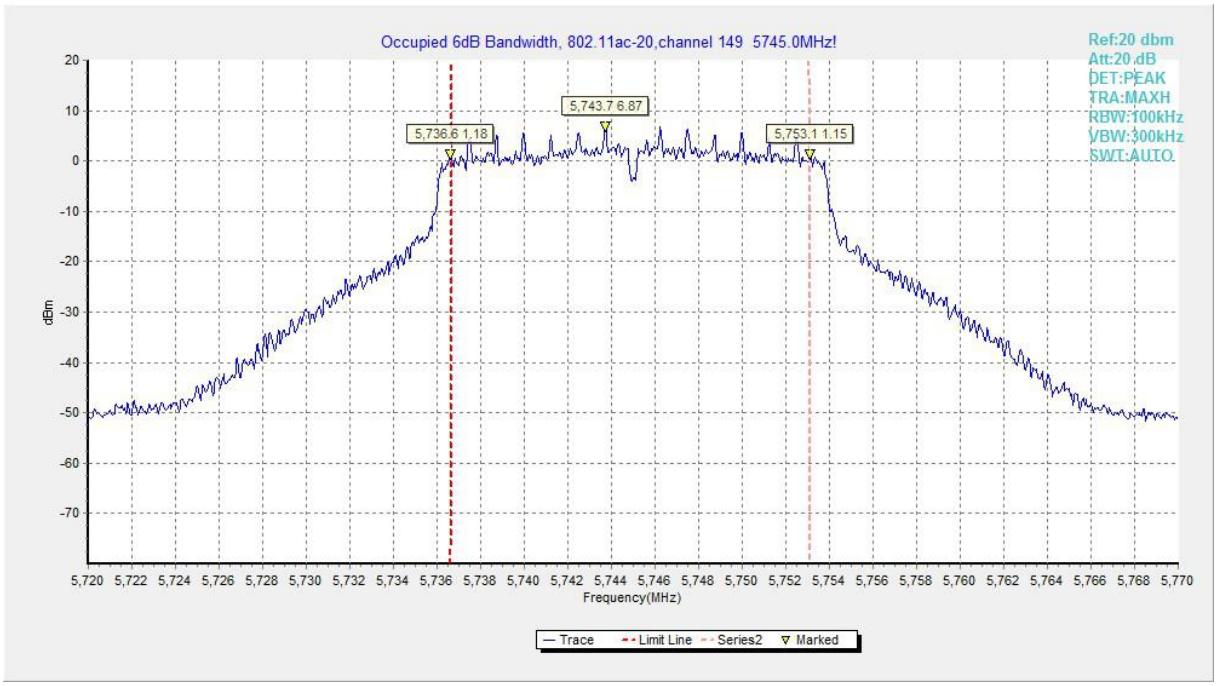


Fig. 7 Occupied 6dB Bandwidth (802.11ac-HT20, Ch 149)

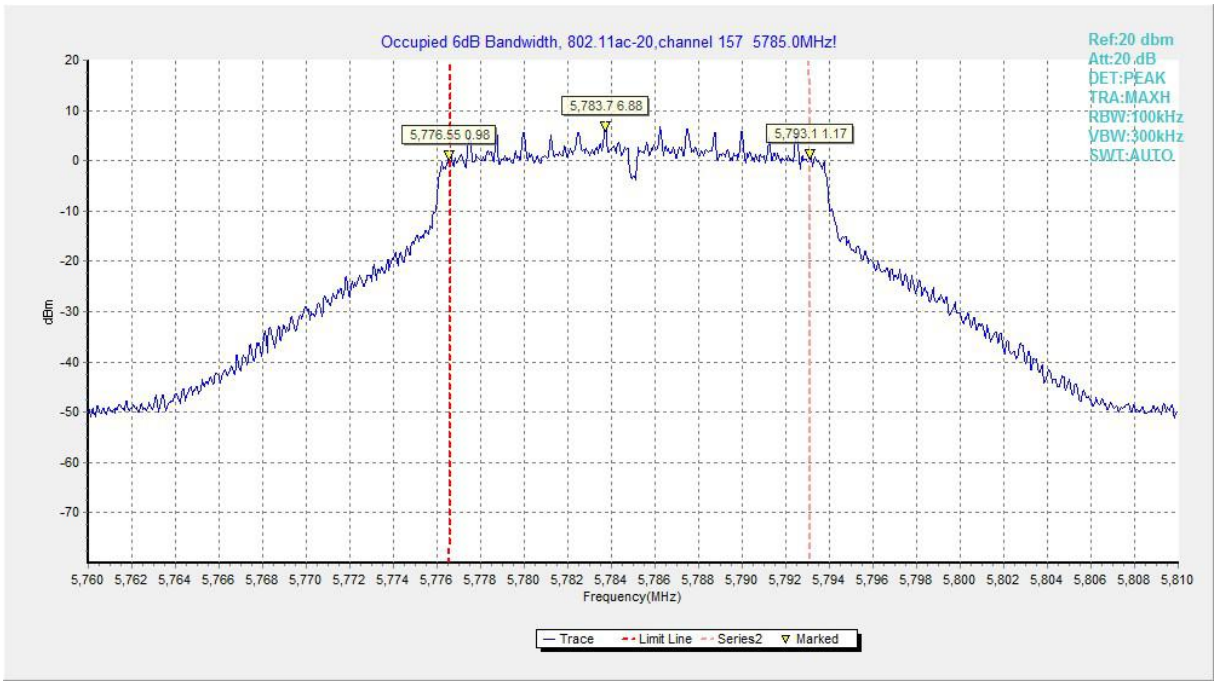


Fig. 8 Occupied 6dB Bandwidth (802.11ac-HT20, Ch 157)

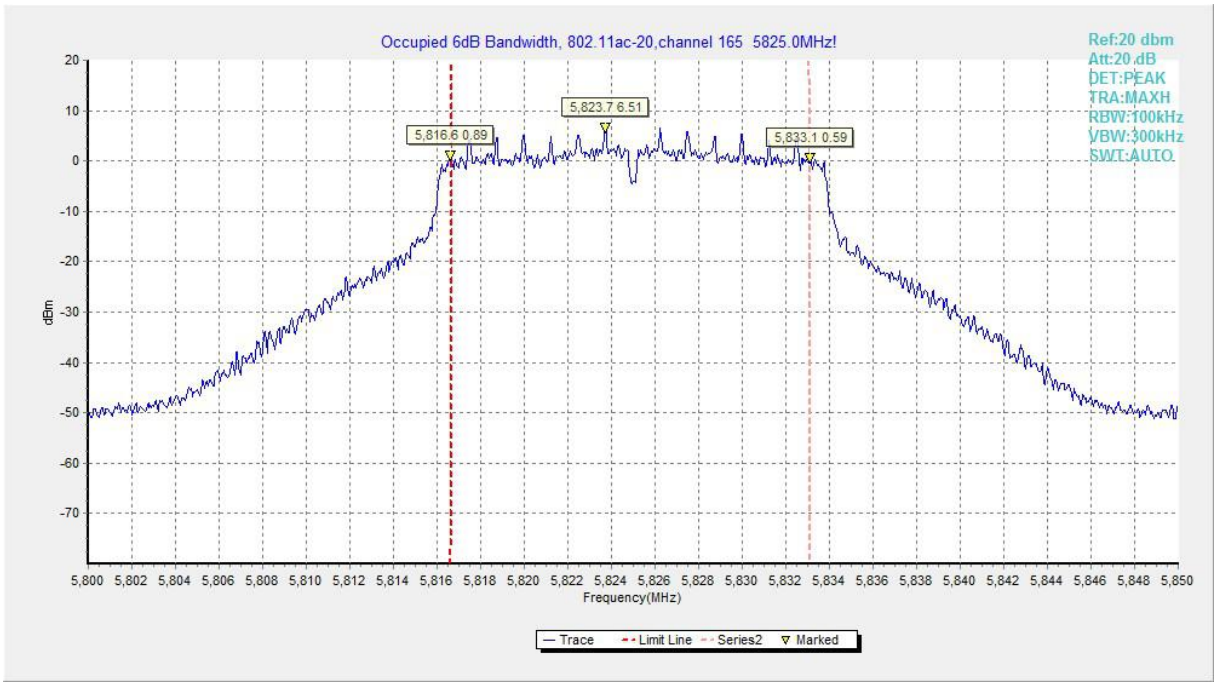


Fig. 9 Occupied 6dB Bandwidth (802.11ac-HT20, Ch 165)

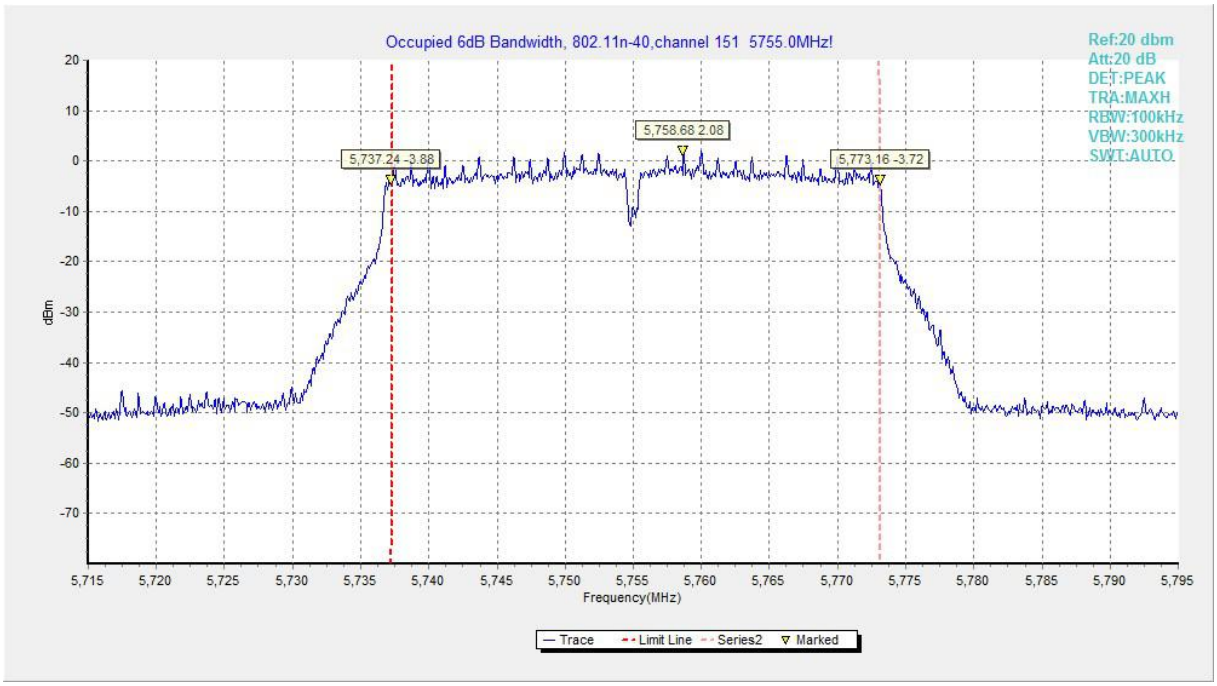


Fig. 10 Occupied 6dB Bandwidth (802.11n-HT40, Ch 151)

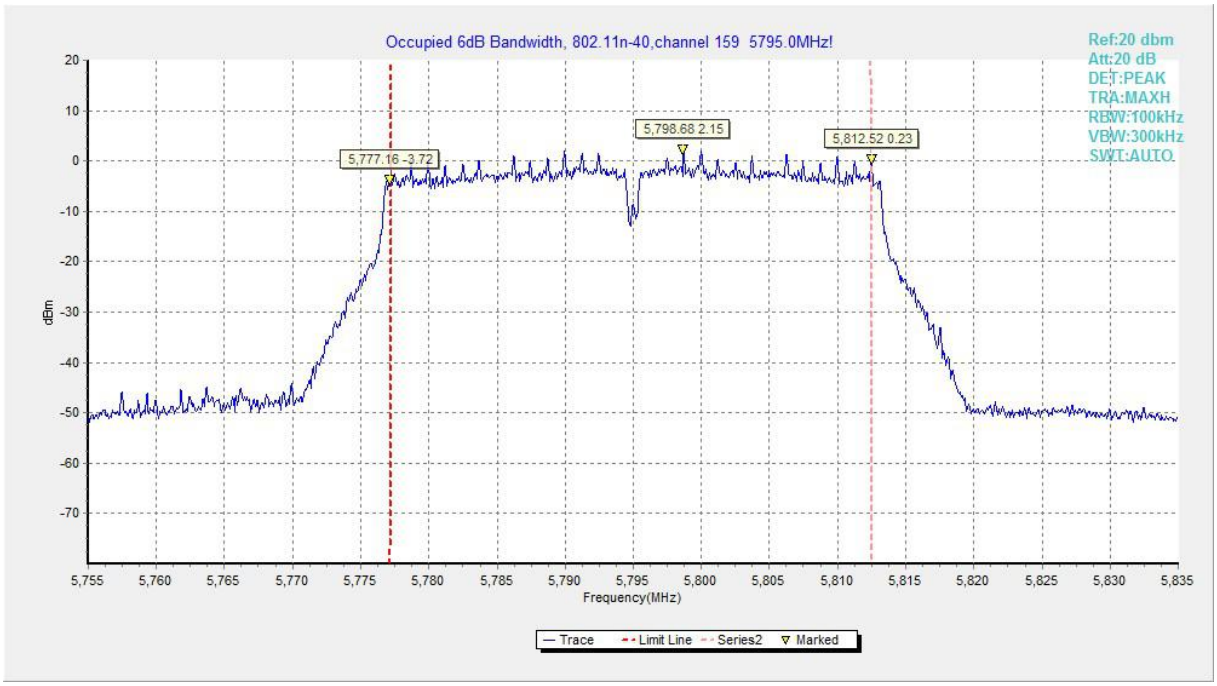


Fig. 11 Occupied 6dB Bandwidth (802.11n-HT40, Ch 159)

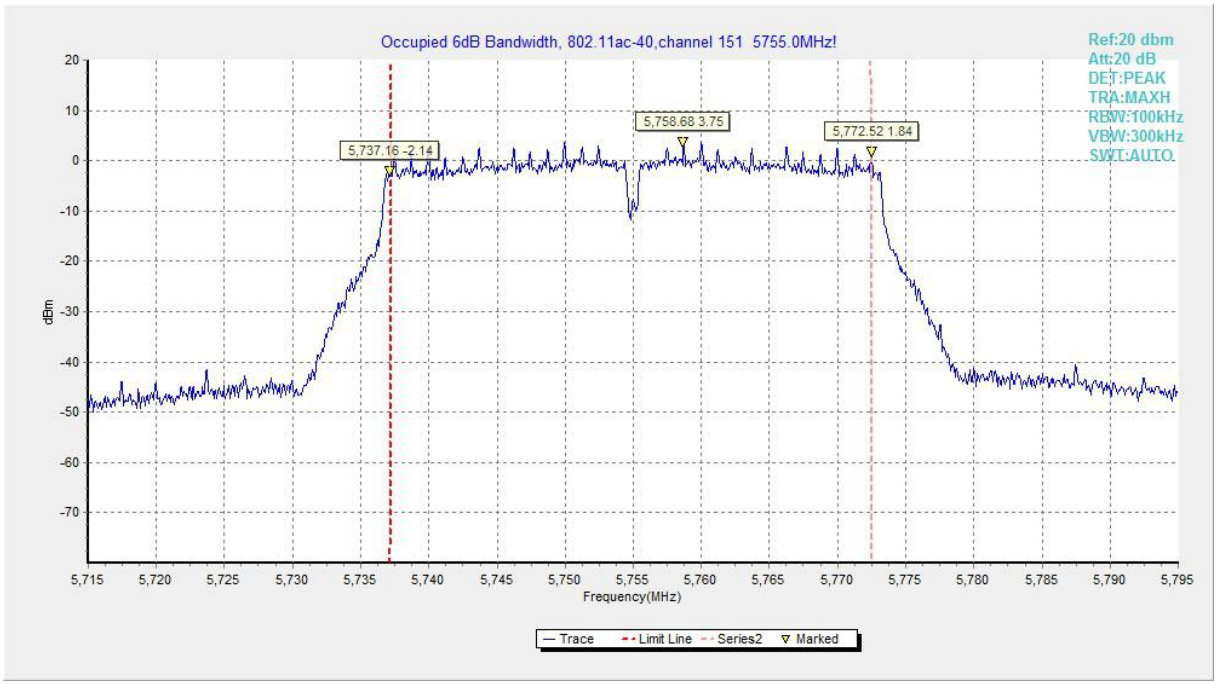


Fig. 12 Occupied 6dB Bandwidth (802.11ac-HT40, Ch 151)

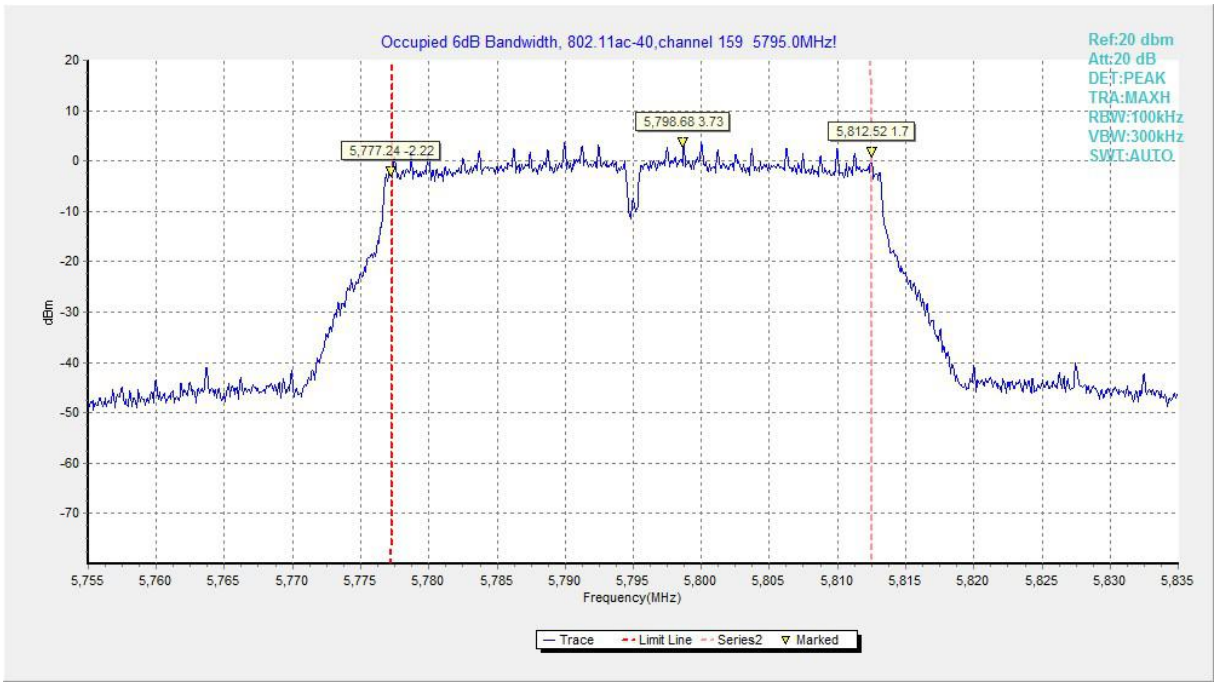


Fig. 13 Occupied 6dB Bandwidth (802.11ac-HT40, Ch 159)

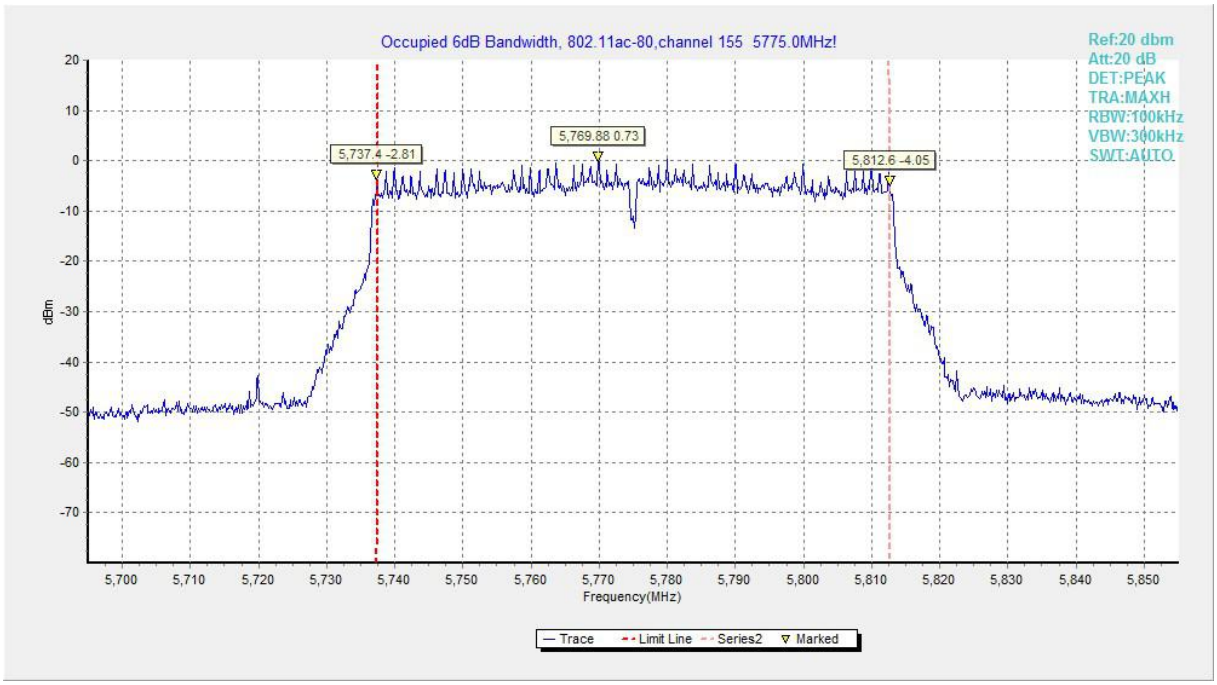


Fig. 14 Occupied 6dB Bandwidth (802.11ac-HT80, Ch 155)

A.5.2 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)	Magin (dBuV/m)
17983	47.1	-25.5	46.7	25.9	H	54	6.9
17975.8	47	-25.5	46.7	25.8	V	54	7
17994	47	-25.5	46.7	25.8	V	54	7
17953.8	46.9	-25.5	46.7	25.7	V	54	7.1
17973	46.9	-25.5	46.7	25.7	H	54	7.1
5724.9	45.2	-16.3	34.3	27.2	V	54	8.8

Ch157

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization	Limit (dBuV/m)	Magin (dBuV/m)
17965.3	47.1	-25.5	46.7	25.9	H	54	6.9
17972.5	47.1	-25.5	46.7	25.9	V	54	6.9
17957.1	47	-25.5	46.7	25.8	V	54	7

17958.8	46.9	-25.5	46.7	25.7	H	54	7.1
17964.2	46.9	-25.5	46.7	25.7	V	54	7.1
17976.9	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)
17998.3	47.2	-25.5	46.7	26	H	54	6.8
17981.8	47	-25.5	46.7	25.8	H	54	7
17990.7	47	-25.5	46.7	25.8	H	54	7
17954.3	46.9	-25.5	46.7	25.7	V	54	7.1
17976.3	46.9	-25.5	46.7	25.7	V	54	7.1
5850	42.6	-16.2	34.4	24.5	V	54	11.4

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)
17985.2	47.1	-25.5	46.7	25.9	H	54	6.9
17976.3	47	-25.5	46.7	25.8	V	54	7
17980.2	47	-25.5	46.7	25.8	V	54	7
17980.8	47	-25.5	46.7	25.8	H	54	7
17986.2	47	-25.5	46.7	25.8	H	54	7
5724.9	45.7	-16.3	34.3	27.7	V	54	8.3

Ch157

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization	Limit (dBuV/m)	Magin (dBuV/m)
17984.6	47	-25.5	46.7	25.8	H	54	7
17993.4	47	-25.5	46.7	25.8	V	54	7
17962.6	46.9	-25.5	46.7	25.7	V	54	7.1
17966.5	46.9	-25.5	46.7	25.7	V	54	7.1
17985.7	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

Ch165

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization	Limit (dBuV/m)	Magin (dBuV/m)
17979.1	47.2	-25.5	46.7	26	H	54	6.8
17983	47.1	-25.5	46.7	25.9	V	54	6.9
17966.5	47	-25.5	46.7	25.8	H	54	7
17972.5	47	-25.5	46.7	25.8	V	54	7
17980.2	47	-25.5	46.7	25.8	V	54	7
5850	41.9	-16.2	34.4	23.8	V	54	12.1

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)
17983	47.1	-25.5	46.7	25.9	V	54	6.9
17966.5	47	-25.5	46.7	25.8	V	54	7
17947.2	46.9	-25.5	46.7	25.7	V	54	7.1
17954.9	46.9	-25.5	46.7	25.7	H	54	7.1
17959.3	46.9	-25.5	46.7	25.7	H	54	7.1
5724.4	45.8	-16.3	34.3	27.8	V	54	8.2

Ch159

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization	Limit (dBuV/m)	Magin (dBuV/m)
17968.7	47	-25.5	46.7	25.8	V	54	7
17979.7	47	-25.5	46.7	25.8	H	54	7
17957.7	46.9	-25.5	46.7	25.7	H	54	7.1
17960.4	46.9	-25.5	46.7	25.7	H	54	7.1
17969.8	46.9	-25.5	46.7	25.7	V	54	7.1
5851.3	44.6	-16.2	34.4	26.5	V	54	9.4

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)
17964.8	47.4	-25.5	46.7	26.2	H	54	6.6
17996.2	47.1	-25.5	46.7	25.9	H	54	6.9
17998.9	47.1	-25.5	46.7	25.9	H	54	6.9
17943.3	47	-25.5	46.7	25.8	V	54	7
17944.5	47	-25.5	46.7	25.8	V	54	7
5725	45.3	-16.3	34.3	27.3	V	54	8.7

Ch157

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization	Limit (dBuV/m)	Magin (dBuV/m)
17973.6	47.2	-25.5	46.7	26	V	54	6.8
17963.2	47	-25.5	46.7	25.8	V	54	7
17970.8	47	-25.5	46.7	25.8	H	54	7
17983.5	47	-25.5	46.7	25.8	V	54	7
17985.7	47	-25.5	46.7	25.8	H	54	7
17997.2	47	-25.5	46.7	25.8	V	54	7

Ch165

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization	Limit (dBuV/m)	Magin (dBuV/m)
17962	47.2	-25.5	46.7	26	H	54	6.8
17961.5	47.1	-25.5	46.7	25.9	H	54	6.9
17994	47.1	-25.5	46.7	25.9	H	54	6.9
17962.6	47	-25.5	46.7	25.8	H	54	7
17983.5	47	-25.5	46.7	25.8	V	54	7
5850	41.8	-16.2	34.4	23.7	V	54	12.2

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	47.2	-25.5	46.7	26	V	54	6.8
17991.8	47.2	-25.5	46.7	26	V	54	6.8

17993.4	47.2	-25.5	46.7	26	V	54	6.8
17982.4	47.1	-25.5	46.7	25.9	V	54	6.9
17967	47	-25.5	46.7	25.8	V	54	7
5724.4	48.9	-16.3	34.3	30.9	V	54	5.1

Ch159

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization	Limit (dBuV/m)	Magin (dBuV/m)
17979.7	47.2	-25.5	46.7	26	V	54	6.8
17986.8	47.1	-25.5	46.7	25.9	V	54	6.9
17997.8	47.1	-25.5	46.7	25.9	H	54	6.9
17950	47	-25.5	46.7	25.8	H	54	7
17975.2	47	-25.5	46.7	25.8	H	54	7
5850.3	42.2	-16.2	34.4	24.1	V	54	11.8

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)
17987.3	47.6	-25.5	46.7	26.4	H	54	6.4
17970.3	47.1	-25.5	46.7	25.9	V	54	6.9
17973.6	47.1	-25.5	46.7	25.9	V	54	6.9
17976.3	47.1	-25.5	46.7	25.9	H	54	6.9
17985.2	47	-25.5	46.7	25.8	V	54	7
17989	47	-25.5	46.7	25.8	V	54	7

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)
17861.4	58.5	-25.5	46.7	37.3	V	74	15.5
17953.8	58.4	-25.5	46.7	37.2	V	74	15.6
17979.7	58.3	-25.5	46.7	37.1	H	74	15.7
17943.9	58.1	-25.5	46.7	36.9	V	74	15.9
17617.2	58	-25.7	46	37.8	V	74	16

5724.9	63.4	-16.3	34.3	45.4	V	74	10.6

Ch157

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization	Limit (dBuV/m)	Magin (dBuV/m)
17998.3	59.7	-25.5	46.7	38.5	H	74	14.3
17963.7	58.4	-25.5	46.7	37.2	V	74	15.6
17995.6	58.4	-25.5	46.7	37.2	V	74	15.6
17946.1	58.2	-25.5	46.7	37	H	74	15.8
17984	58.2	-25.5	46.7	37	V	74	15.8
17985.7	58.2	-25.5	46.7	37	V	74	15.8

Ch165

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization	Limit (dBuV/m)	Magin (dBuV/m)
17972.5	58.9	-25.5	46.7	37.7	H	74	15.1
17975.2	58.6	-25.5	46.7	37.4	V	74	15.4
17985.2	58.5	-25.5	46.7	37.3	H	74	15.5
17967.5	58.3	-25.5	46.7	37.1	V	74	15.7
17892.8	58.2	-25.5	46.7	37	V	74	15.8
5853.5	55.5	-16.2	34.4	37.4	V	74	18.5

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)
17976.3	59.4	-25.5	46.7	38.2	V	74	14.6
17950.5	58.7	-25.5	46.7	37.5	H	74	15.3
17971.4	58.6	-25.5	46.7	37.4	H	74	15.4
17973	58.3	-25.5	46.7	37.1	H	74	15.7
17953.2	58.2	-25.5	46.7	37	H	74	15.8
5723.5	61.8	-16.3	34.3	43.8	V	74	12.2

Ch157

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization	Limit (dBuV/m)	Magin (dBuV/m)
17994.5	58.6	-25.5	46.7	37.4	V	74	15.4
17967	58.4	-25.5	46.7	37.2	H	74	15.6
17974.7	58.4	-25.5	46.7	37.2	V	74	15.6
17883.4	58.2	-25.5	46.7	37	V	74	15.8
17933.5	58.2	-25.5	46.7	37	V	74	15.8
17963.7	58.2	-25.5	46.7	37	H	74	15.8

Ch165

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization	Limit (dBuV/m)	Magin (dBuV/m)
17977.5	58.8	-25.5	46.7	37.6	V	74	15.2
17942.8	58.6	-25.5	46.7	37.4	H	74	15.4
17958.8	58.6	-25.5	46.7	37.4	V	74	15.4
17954.3	58.5	-25.5	46.7	37.3	H	74	15.5
17980.8	58.4	-25.5	46.7	37.2	H	74	15.6
5850.6	54.9	-16.2	34.4	36.8	V	74	19.1

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)
17962.6	59	-25.5	46.7	37.8	H	74	15
17994.5	58.2	-25.5	46.7	37	H	74	15.8
17848.2	58.1	-25.5	46.7	36.9	H	74	15.9
17967	58.1	-25.5	46.7	36.9	V	74	15.9
17988.5	58.1	-25.5	46.7	36.9	H	74	15.9
5724.8	64.1	-16.3	34.3	46.1	V	74	9.9

Ch159

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization	Limit (dBuV/m)	Magin (dBuV/m)
17968.7	59	-25.5	46.7	37.8	V	74	15
17992.8	58.9	-25.5	46.7	37.7	H	74	15.1

17989.5	58.8	-25.5	46.7	37.6	H	74	15.2
17963.2	58.5	-25.5	46.7	37.3	H	74	15.5
17995.6	58.5	-25.5	46.7	37.3	V	74	15.5
5870.8	56.5	-16.2	34.4	38.4	V	74	17.5

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)
17957.7	58.9	-25.5	46.7	37.7	H	74	15.1
17979.7	58.9	-25.5	46.7	37.7	V	74	15.1
17952.2	58.3	-25.5	46.7	37.1	V	74	15.7
17990.7	58.2	-25.5	46.7	37	V	74	15.8
17992.8	58.2	-25.5	46.7	37	H	74	15.8
5725	58.3	-16.3	34.3	40.3	V	74	15.7

Ch157

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization	Limit (dBuV/m)	Magin (dBuV/m)
17974.2	59.2	-25.5	46.7	38	H	74	14.8
17981.3	58.8	-25.5	46.7	37.6	V	74	15.2
17961.5	58.5	-25.5	46.7	37.3	H	74	15.5
17984	58.5	-25.5	46.7	37.3	H	74	15.5
17994	58.5	-25.5	46.7	37.3	H	74	15.5
17995.6	58.4	-25.5	46.7	37.2	H	74	15.6

Ch165

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization	Limit (dBuV/m)	Magin (dBuV/m)
17908.2	58.7	-25.5	46.7	37.5	V	74	15.3
17892.8	58.4	-25.5	46.7	37.2	H	74	15.6
17937.3	58.3	-25.5	46.7	37.1	H	74	15.7
17880.7	58.2	-25.5	46.7	37	V	74	15.8
17915.8	58.2	-25.5	46.7	37	V	74	15.8
5850.3	53.5	-16.2	34.4	35.4	V	74	20.5

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)
17952.7	59.1	-25.5	46.7	37.9	V	74	14.9
17948.8	58.5	-25.5	46.7	37.3	V	74	15.5
17993.4	58.2	-25.5	46.7	37	V	74	15.8
17896	58.1	-25.5	46.7	36.9	H	74	15.9
17918.6	58.1	-25.5	46.7	36.9	H	74	15.9
5724.2	60.6	-16.3	34.3	42.6	V	74	13.4

Ch159

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	P_{Mea} (dBuV/m)	Polarization	Limit (dBuV/m)	Magin (dBuV/m)
17965.9	58.6	-25.5	46.7	37.4	H	74	15.4
17985.2	58.6	-25.5	46.7	37.4	V	74	15.4
17956.5	58.5	-25.5	46.7	37.3	V	74	15.5
17957.1	58.5	-25.5	46.7	37.3	V	74	15.5
17976.9	58.5	-25.5	46.7	37.3	H	74	15.5
5851.1	54	-16.2	34.4	35.9	V	74	20

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)
17951.6	58.6	-25.5	46.7	37.4	V	74	15.4
17991.2	58.6	-25.5	46.7	37.4	H	74	15.4
17970.3	58.5	-25.5	46.7	37.3	V	74	15.5
17951	58.1	-25.5	46.7	36.9	H	74	15.9
17980.8	58	-25.5	46.7	36.8	V	74	16
17983	58	-25.5	46.7	36.8	H	74	16

Conclusion: PASS

A6.2 Band Edges - Radiated

Measurement Limit:

Standard	Limit (dBm/MHz)	
FCC 47 CFR Part 15.407	at the band edge	27
	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.1	P
	5825 MHz	Fig.2	P
802.11n HT20	5745 MHz	Fig.3	P
	5825 MHz	Fig.4	P
802.11ac HT20	5745 MHz	Fig.5	P
	5825 MHz	Fig.6	P
802.11n HT40	5755 MHz	Fig.7	P
	5795 MHz	Fig.8	P
802.11ac HT40	5755 MHz	Fig.9	P
	5795 MHz	Fig.10	P
802.11ac HT80	5775 MHz	Fig.11	P
	5775 MHz	Fig.12	P

Conclusion: PASS
Test graphs as below:

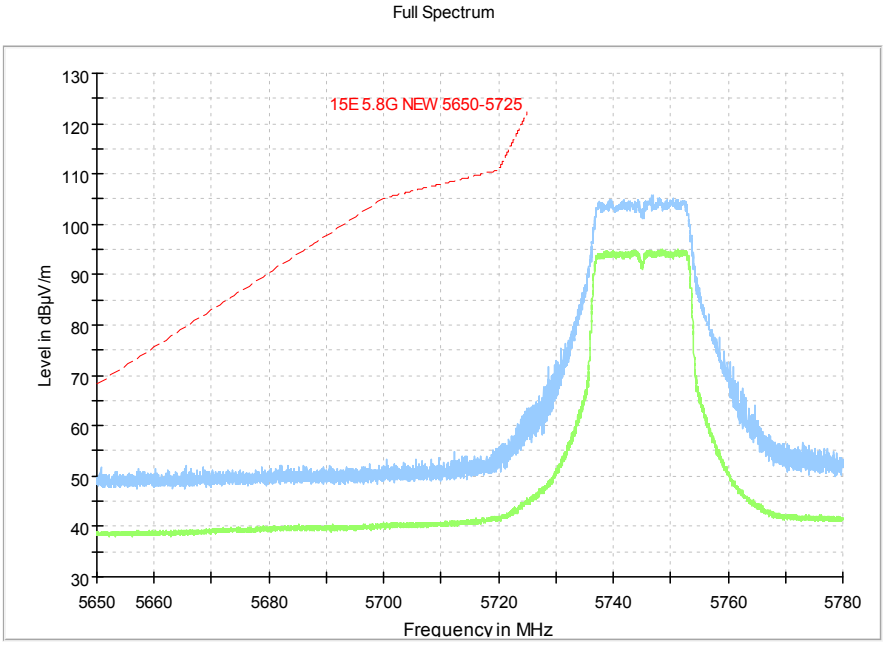


Fig. 83 Band Edges (802.11a, 5745MHz)

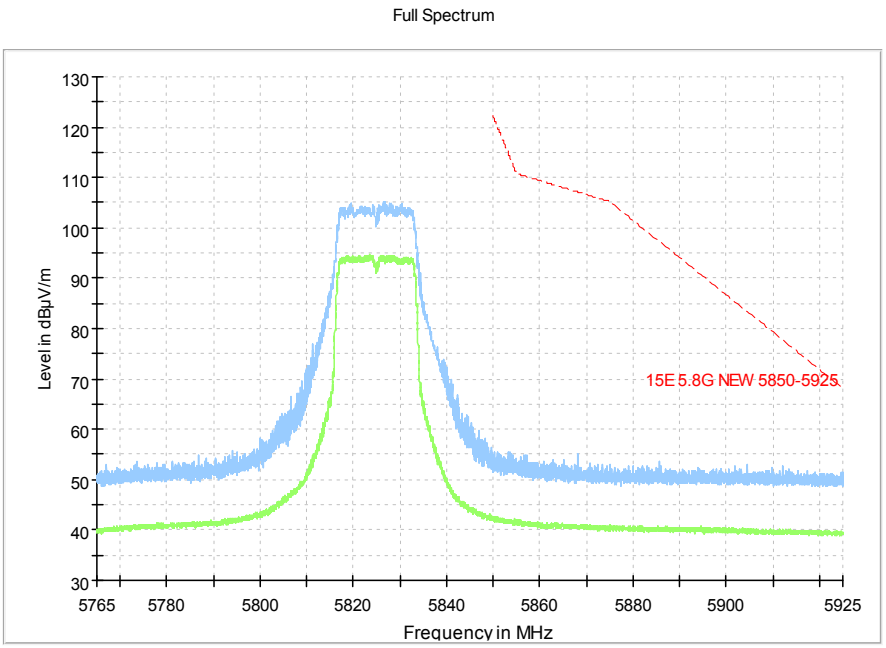


Fig. 84 Band Edges (802.11a, 5825MHz)

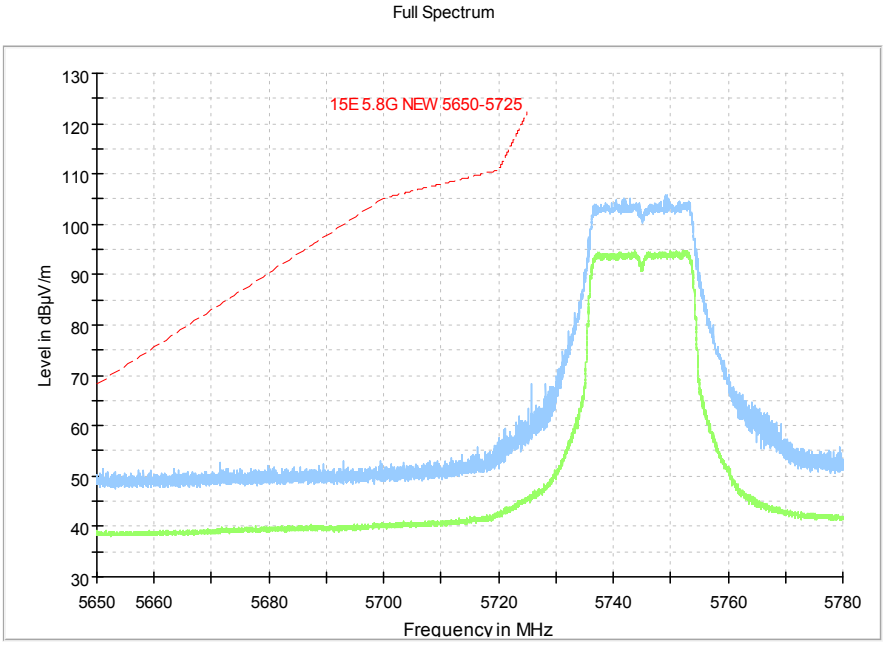


Fig. 85 Band Edges (802.11n-HT20, 5745MHz)

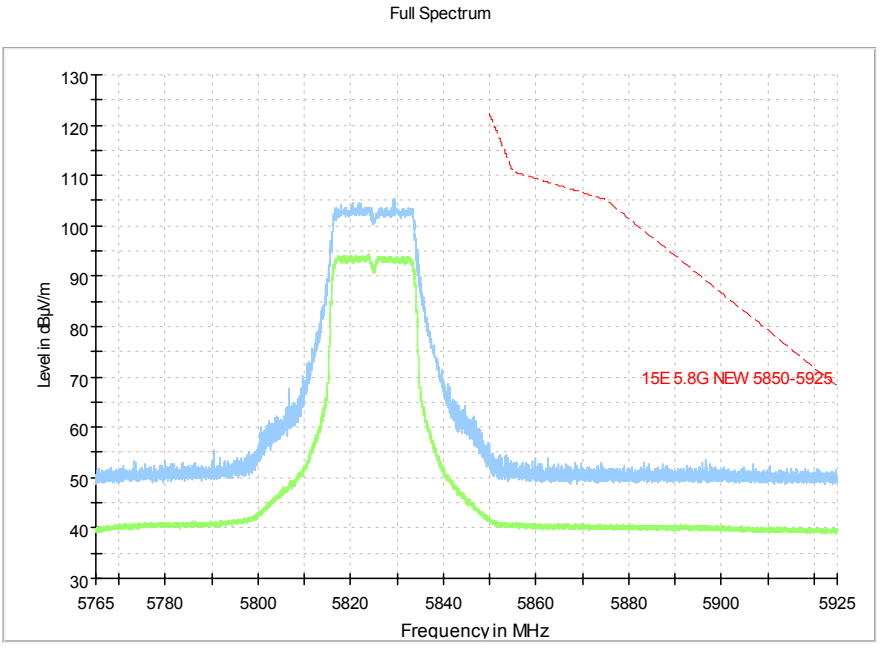


Fig. 86 Band Edges (802.11n-HT20, 5825MHz)

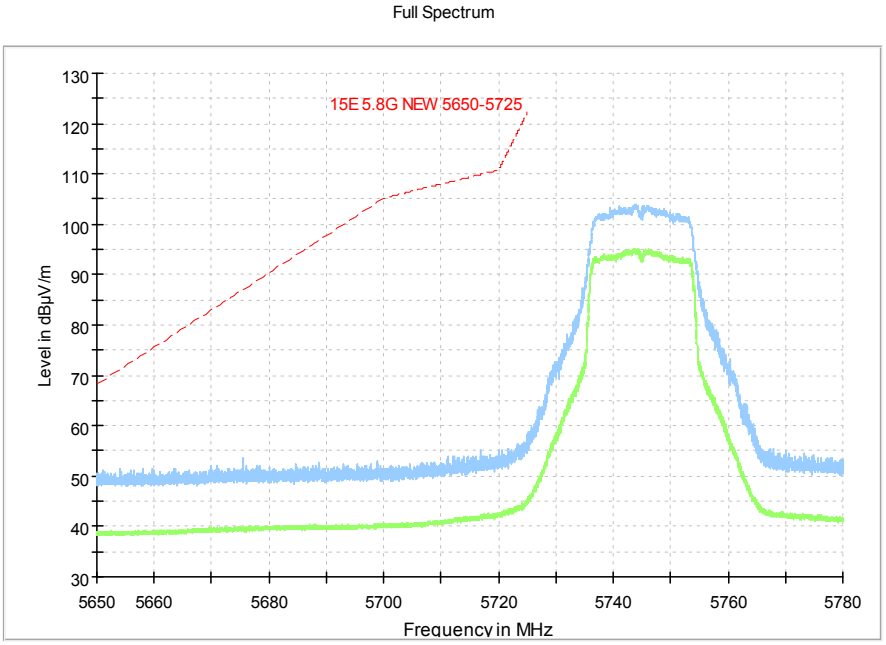


Fig. 87 Band Edges (802.11ac-HT20, 5745MHz)

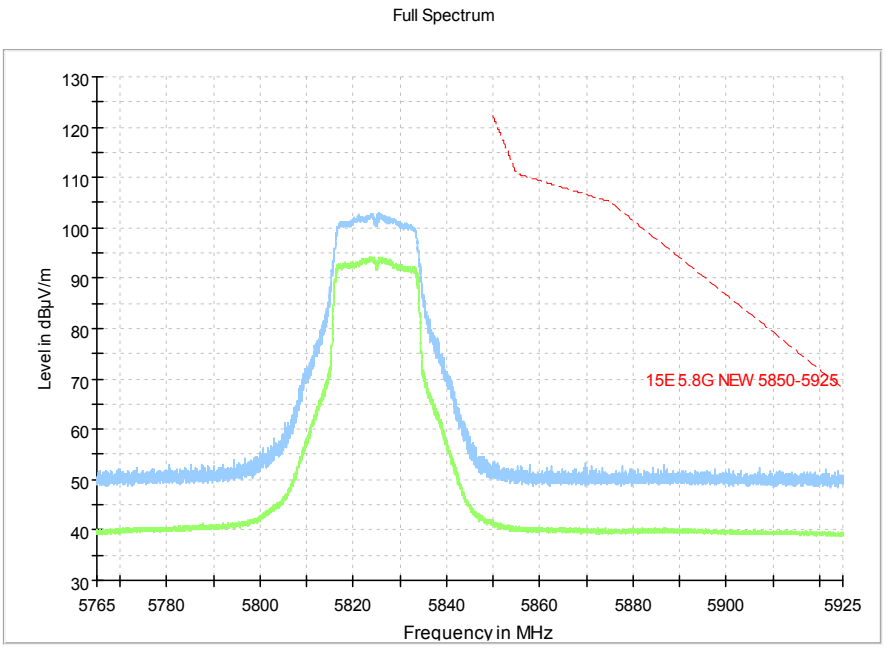


Fig. 88 Band Edges (802.11ac-HT20, 5825MHz)

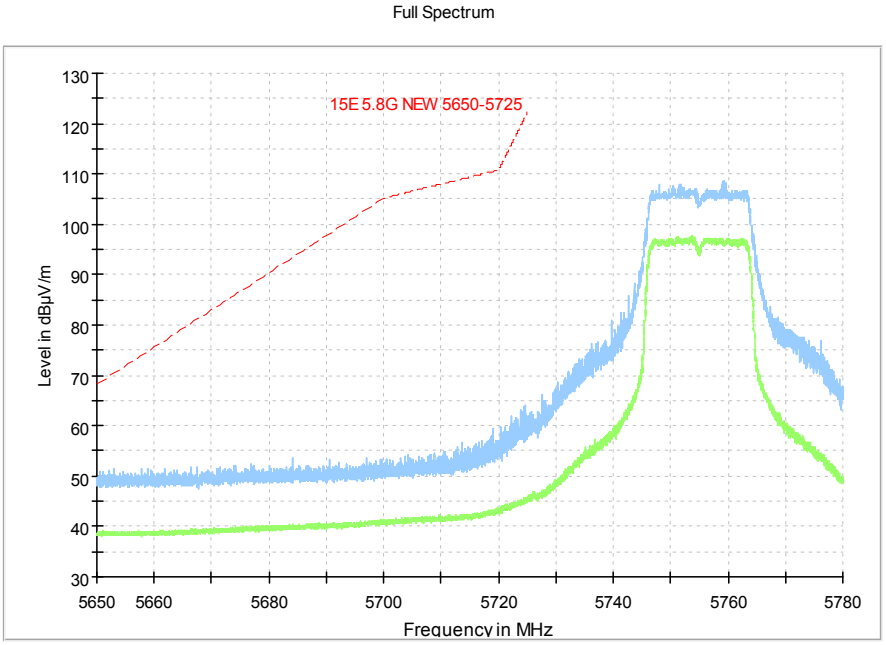


Fig. 89 Band Edges (802.11n-HT40, 5755MHz)

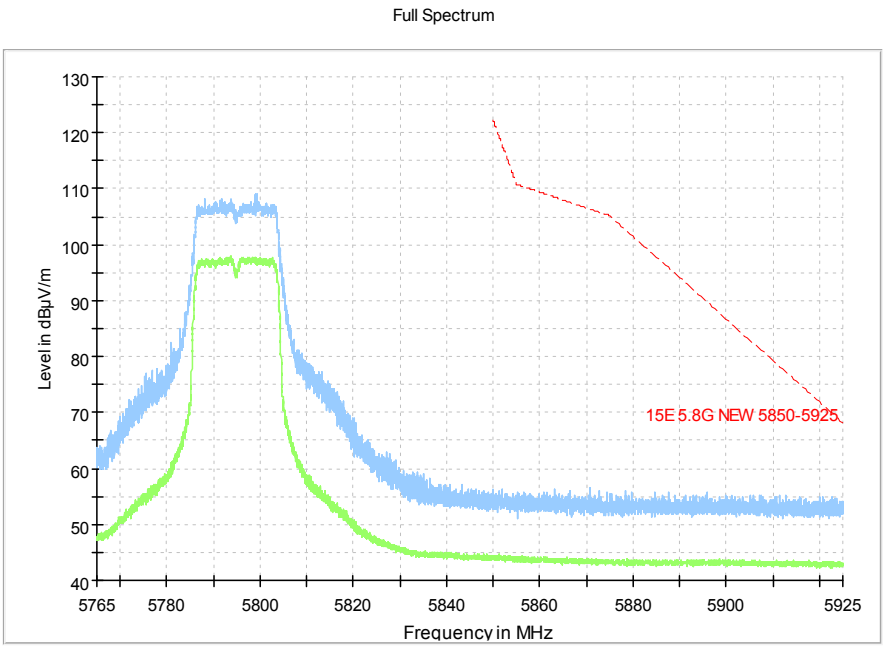


Fig. 90 Band Edges (802.11n-HT40, 5795MHz)

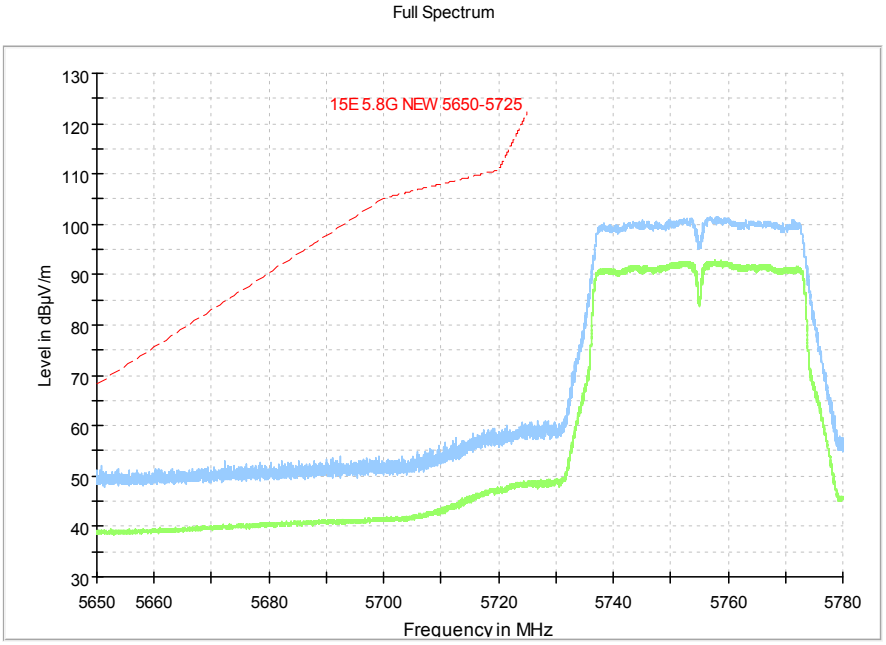


Fig. 91 Band Edges (802.11ac-HT40, 5755MHz)

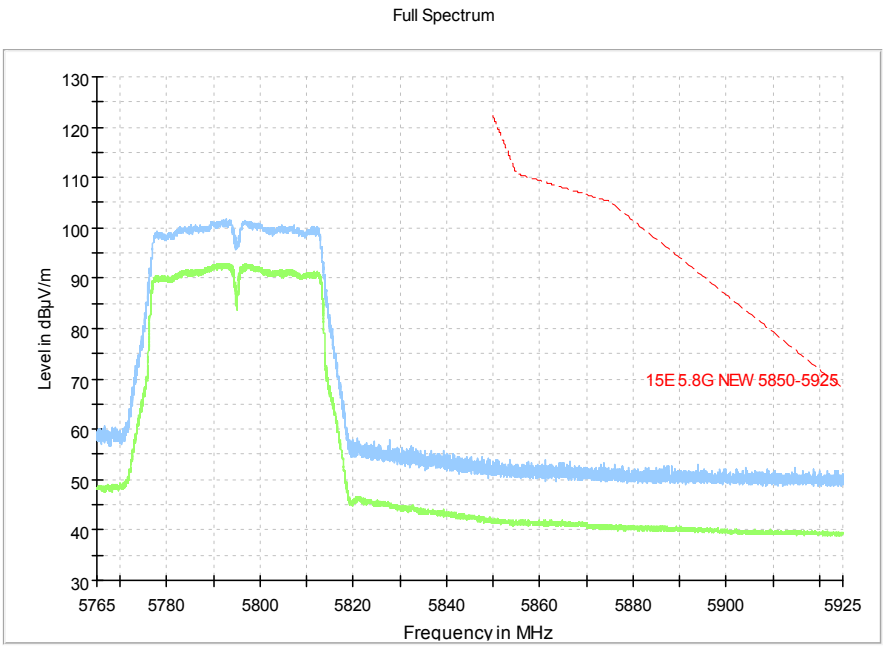


Fig. 92 Band Edges (802.11ac-HT40, 5795MHz)

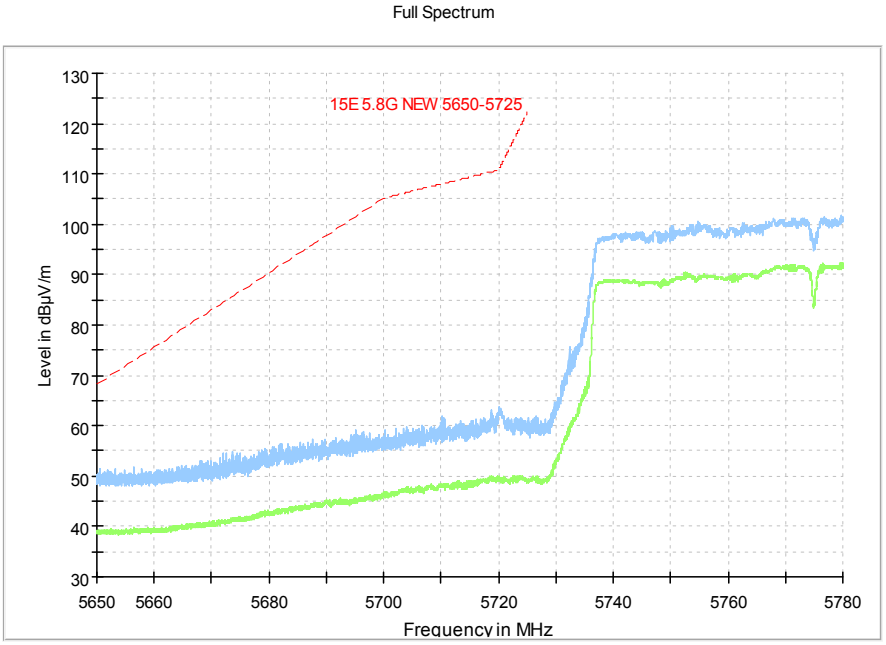


Fig. 93 Band Edges (802.11ac-HT80, 5775MHz)

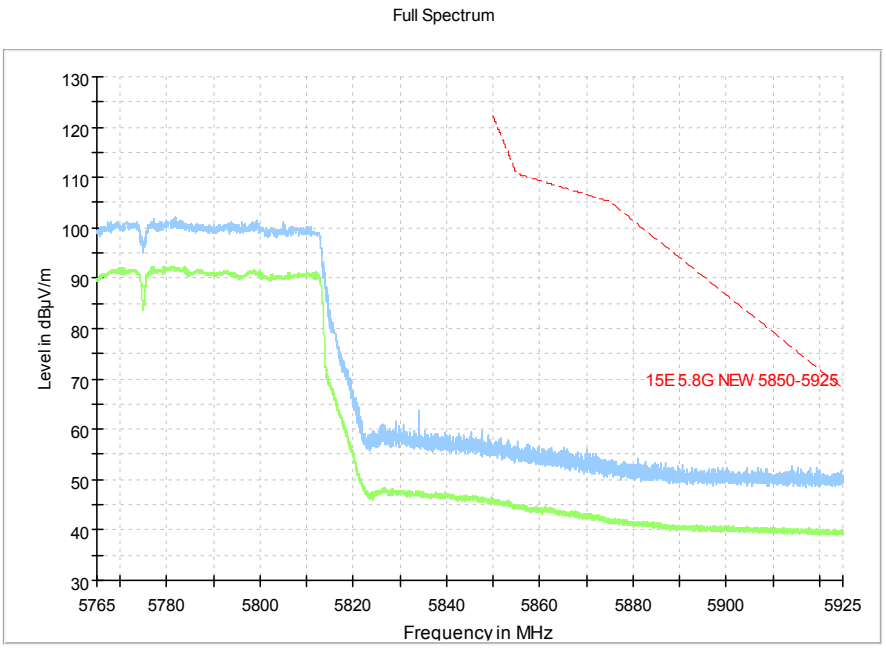


Fig. 94 Band Edges (802.11ac-HT80, 5775MHz)

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 (dBμV)	Result (dBμV)		Conclusion
		With charger		
		802.11a	Idle	
0.15 to 0.5	66 to 56	Fig. 95	Fig. 96	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 (dBμV)	Result (dBμV)		Conclusion
		With charger		
		802.11a	Idle	
0.15 to 0.5	56 to 46	Fig.95	Fig.96	P
0.5 to 5	46			
5 to 30	50			
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.				

Note:The measurement results showed here are worst cases of the combinations of different chargers and cables.

Conclusion: PASS

Test graphs as below:

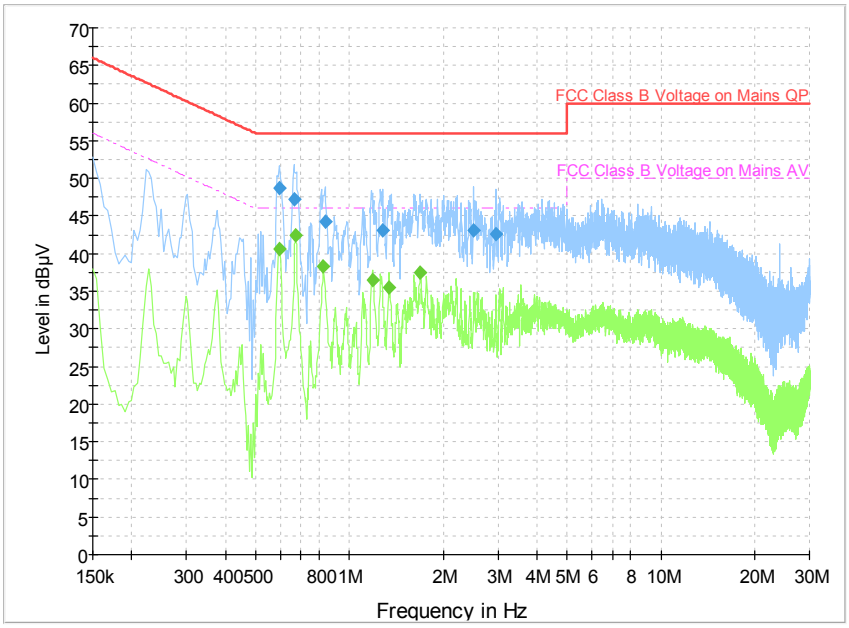


Fig. 95 AC Powerline Conducted Emission-802.11a

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.595500	48.8	GND	L1	10.0	7.2	56.0
0.663000	47.3	GND	L1	10.0	8.7	56.0
0.834000	44.3	GND	L1	10.0	11.7	56.0
1.279500	43.2	GND	L1	10.0	12.8	56.0
2.508000	43.2	GND	L1	10.1	12.8	56.0
2.958000	42.5	GND	L1	10.1	13.5	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.595500	40.6	GND	L1	10.0	5.4	46.0
0.672000	42.4	GND	L1	10.0	3.6	46.0
0.825000	38.2	GND	L1	10.0	7.8	46.0
1.185000	36.5	GND	L1	10.0	9.5	46.0
1.342500	35.5	GND	L1	10.0	10.5	46.0
1.689000	37.5	GND	L1	10.0	8.5	46.0

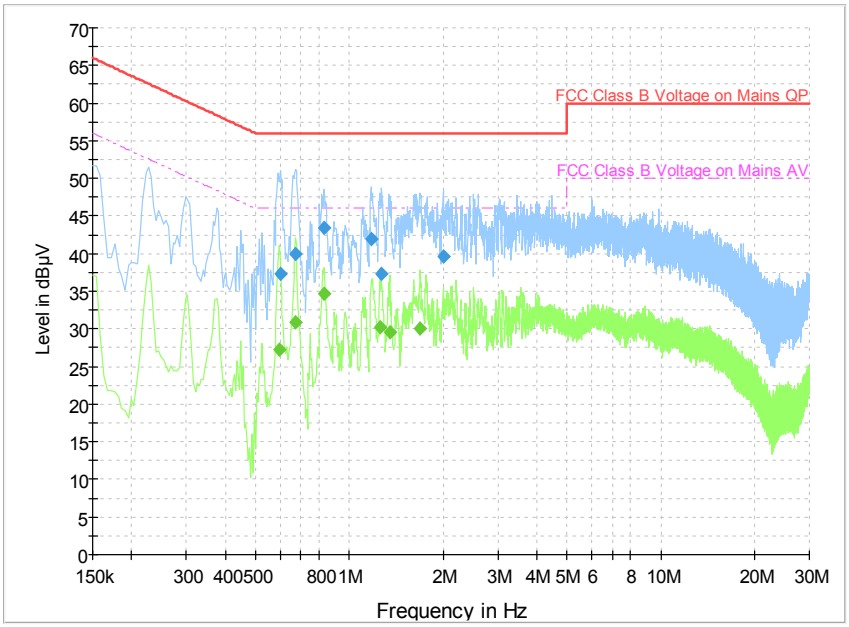


Fig. 96 AC Powerline Conducted Emission-Idle

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.600000	37.2	GND	N	10.0	18.8	56.0
0.672000	40.0	GND	L1	10.0	16.0	56.0
0.829500	43.3	GND	L1	10.0	12.7	56.0
1.176000	42.0	GND	L1	10.0	14.0	56.0
1.270500	37.3	GND	L1	10.0	18.7	56.0
1.999500	39.6	GND	L1	10.0	16.4	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.595500	27.3	GND	L1	10.0	18.7	46.0
0.672000	30.9	GND	L1	10.0	15.1	46.0
0.829500	34.7	GND	L1	10.0	11.3	46.0
1.261500	30.2	GND	L1	10.0	15.8	46.0
1.347000	29.6	GND	L1	10.0	16.4	46.0
1.689000	30.0	GND	L1	10.0	16.0	46.0

ANNEX B: Accreditation Certificate

United States Department of Commerce
National Institute of Standards and Technology

NVLAP®

ilac-MRA

Certificate of Accreditation to ISO/IEC 17025:2017

NVLAP LAB CODE: 600118-0

Telecommunication Technology Labs, CAICT
Beijing
China

is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for:

Electromagnetic Compatibility & Telecommunications

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).

2020-09-29 through 2021-09-30
Effective Dates

DEPARTMENT OF COMMERCE · UNITED STATES OF AMERICA

For the National Voluntary Laboratory Accreditation Program

***** END OF REPORT BODY *****