



FCC PART 15C TEST REPORT No.I21Z70497-IOT05

for

Samsung Electronics Co., Ltd.

Tablet with Bluetooth, WLAN

SM-X200

With

FCC ID: ZCASM200

Hardware Version: REV1.0

Software Version: X200.001

Issued Date: 2021-11-15

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

Report Number	Revision	Description	Issue Date
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1. TEST LABORATORY

1.1. Introduction & Accreditation

Telecommunication Technology Labs, CAICT is an ISO/IEC 17025:2017 accredited test laboratory under NATIONAL VOLUNTARY LABORATORY ACCREDITATION PROGRAM (NVLAP) with lab code 600118-0, and is also an FCC accredited test laboratory (CN5017), and ISED accredited test laboratory (ISED#: 24849). The detail accreditation scope can be found on NVLAP website.

1.2. Testing Location

Location 1: CTTL(huayuan North Road)

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

Location 2: CTTL(BDA)

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

1.3. Testing Environment

Normal Temperature: 15-35°C

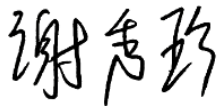
Relative Humidity: 20-75%

1.4. Project date

Testing Start Date: 2021-10-08

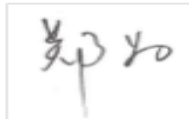
Testing End Date: 2021-11-15

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

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2.2. Manufacturer Information

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

3. EQUIPMENT UNDER TEST (EUT) AND ANCILLARY

EQUIPMENT(AE)

3.1. About EUT

Description	Tablet with Bluetooth, WLAN
Model name	SM-X200
FCC ID	ZCASM200
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
UT10a	/	REV1.0	X200.001
UT14a	/	REV1.0	X200.001
UT05a	2170497UT05a	REV1.0	X200.001
UT08a	2170497UT08a	REV1.0	X200.001

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

3.3. Internal Identification of AE used during the test

AE ID*	Description	Type	SN
AE1	Adapter1	/	/
AE2	Adapter2	/	/
AE3	Adapter3	/	/
AE4	Adapter4	/	/
AE5	Adapter5	/	/
AE6	Adapter6	/	/
AE7	Adapter7	/	/
AE8	Adapter8	/	/
AE9	Adapter9	/	/
AE10	Adapter10	/	/
AE11	Adapter11	/	/
AE12	USB Cable	/	/
AE13	Headset1	/	/
AE14	Headset2	/	/
AE15	Battery1	/	/
AE16	Battery2	/	/
AE17	Battery3	/	/

AE1

Model	EP-TA50EWE
Manufacturer	HAEM Co.,Ltd



Length of cable	/
AE2	
Model	EP-TA50UWE
Manufacturer	HAEM Co.,Ltd
Length of cable	/
AE3	
Model	EP-TA50EWE
Manufacturer	RFTECH Co., Ltd.
Length of cable	/
AE4	
Model	EP-TA200EWE
Manufacturer	RFTECH Co., Ltd.
Length of cable	/
AE5	
Model	EP-TA50EWE
Manufacturer	Salcomp (Shenzhen) Co., Ltd.
Length of cable	/
AE6	
Model	EP-TA50UWE
Manufacturer	Salcomp (Shenzhen) Co., Ltd.
Length of cable	/
AE7	
Model	EP-TA50UWE
Manufacturer	DONGYANG E&P Inc.
Length of cable	/
AE8	
Model	EP-TA50BW
Manufacturer	Salcomp (Shenzhen) Co., Ltd.
Length of cable	/
AE9	
Model	EP-TA50JWE
Manufacturer	RFTech
Length of cable	/
AE10	
Model	EP-TA200JWE
Manufacturer	RFTech
Length of cable	/
AE11	
Model	EP-TA50JWE
Manufacturer	HAEM
Length of cable	/
AE12	
Model	EP-DR140AWE(GH39-01999A)
Manufacturer	Samsung Electronics Co., Ltd.

Length of cable	/	/
AE13		
Model	CH59-15054A	
Manufacturer	DONGGUAN YOUNGBO ELECTRONICS CO.,LTD	
Length of cable	/	
AE14		
Model	CH59-15054A	
Manufacturer	CRESYN HANOI Co., Ltd	
Length of cable	/	
AE15		
Type	Secondary Li-ion Battery	
SN	HQ-6300NA	
Manufacturer	Ningde Amperex Technology Limited	
AE16		
Type	Secondary Li-ion Battery	
SN	HQ-6300SD	
Manufacturer	SCUD (Fujian) Electronics CO.,LTD	
AE17		
Type	Secondary Li-ion Battery	
SN	HQ-6300SA	
Manufacturer	SCUD (Fujian) Electronics CO.,LTD	

*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 Tablet with Bluetooth, WLAN 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 CFR 47, Part 15, Subpart C and E:	
FCC Part15	15.205 Restricted bands of operation;	2018
	15.209 Radiated emission limits, general requirements;	
	15.407 General technical requirements	
ANSI C63.10	Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the	2013

	Range of 9 kHz to 40 GHz	
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)	/	BR
Peak Power Spectral Density	15.407 (a)	/	BR
Occupied 6dB Bandwidth	15.407 (e)	/	BR
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
BR	Re-use test data from basic model report.
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. Explanation of re-use of test data

The Equipment Under Test (EUT) model SM-X200 (FCC ID: ZCASM200) is a variant product of SM-X205 (FCC ID: ZCASM205), according to the declaration of changes provided by the applicant and FCC KDB publication 484596 D01, spot check measurements (output power and radiated spurious emission) were performed on this device, all the other test results are derived from test report No.I21Z70495-IOT05.

For detail differences between two models please refer the Declaration of Changes document.

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	2022-05-24
2	LISN	ENV216	101459	R&S	1 year	2022-03-16
3	Test Receiver	ESCI	100766	R&S	1 year	2022-03-09
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	100376	R&S	1 year	2022-09-15
2	EMI Antenna	VULB9163	9163-482	Schwarzbeck	1 year	2021-11-04
3	EMI Antenna	VULB9163	9163-514	Schwarzbeck	1 year	2022-03-22
4	EMI Antenna	3117	00119024	ETS-Lindgren	1 year	2022-04-11
5	EMI Antenna	LB-180-NF	2030013000 41	A-INFO	1 year	2022-02-28
6	EMI Antenna	LB-180400 -25-C-KF	2110084000 06	A-INFO	1 year	2022-02-28
7	Analytical Spectrometer	FSV40	101047	R&S	1 year	2022-06-02
8	Analytical Spectrometer	FSV40	101525	R&S	1 year	2022-01-19

Note: the EMI Antenna which Serial Number is 9163-482 was before Calibration Due date when used.

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

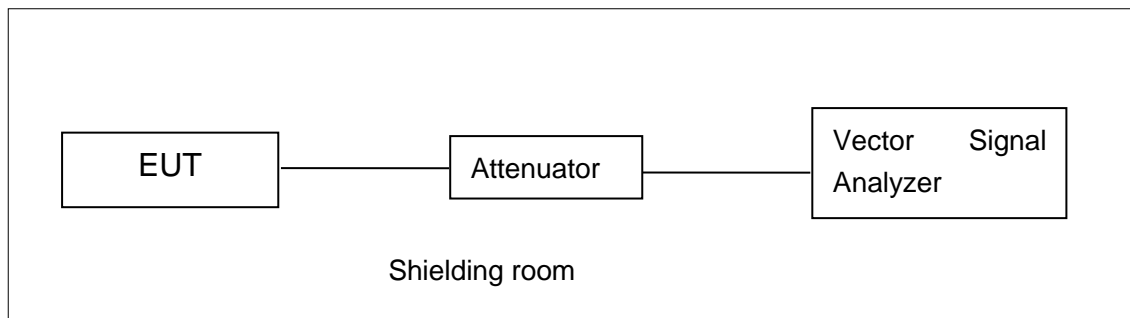
Measurement Uncertainty : 3.10dB,k=2

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

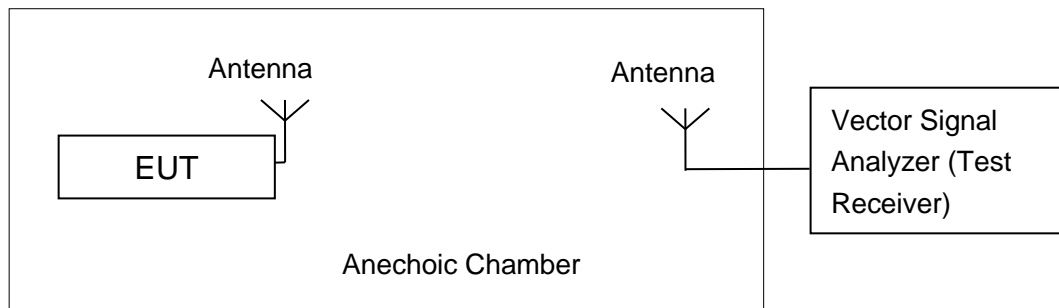


A.1.2. Radiated Emission Measurements

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 = 3MHz;



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.2.1 Antenna Gain

Antenna gain is -1.37dBi and the value is supplied by the applicant or manufacturer.

A.2.2. Maximum Average Output Power-Conducted

Duty Cycle

802.11a	6Mbps	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
Duty cycle	98%	97%	96%	95%	94%	93%	91%	90%

802.11n-HT20	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Duty cycle	98%	97%	96%	95%	93%	91%	89%	88%

802.11n-HT40	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Duty cycle	98%	97%	96%	95%	93%	91%	90%	89%

802.11ac-HT20	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	MCS8
Duty cycle	98%	97%	96%	95%	92%	90%	89%	88%	86%

802.11ac-HT40	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	MCS8	MCS9
Duty cycle	98%	98%	97%	95%	94%	93%	92%	91%	91%	90%

802.11ac-HT80	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	MCS8	MCS9
Duty cycle	98%	97%	95%	94%	93%	91%	91%	90%	89%	88%

Measurement Results:

802.11a mode

Mode	Data Rate (Mbps)	Test Result (dBm)		
		5745MHz (Ch149)	5785MHz (Ch157)	5825MHz (Ch165)
802.11a	6	15.07	/	/
	9	15.29	/	/
	12	15.28	/	/
	18	15.34	15.02	14.74
	24	15.24	/	/
	36	15.21	/	/
	48	14.86	/	/
	54	14.90	/	/

The data rate 18Mbps is selected as worse condition, and the following cases are performed with this condition.

802.11n-HT20 mode

Mode	Data Rate (Index)	Test Result (dBm)		
		5745MHz (Ch149)	5785MHz (Ch157)	5825MHz (Ch165)
802.11n (20MHz)	MCS0	15.81	15.40	15.05
	MCS1	15.77	/	/
	MCS2	15.76	/	/
	MCS3	15.76	/	/
	MCS4	15.18	/	/
	MCS5	15.25	/	/
	MCS6	15.24	/	/
	MCS7	15.28	/	/

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

802.11ac-HT20 mode

Mode	Data Rate (Index)	Test Result (dBm)		
		5745MHz (Ch149)	5785MHz (Ch157)	5825MHz (Ch165)
802.11ac (20MHz)	MCS0	15.02	14.62	14.35
	MCS1	14.96	/	/
	MCS2	13.83	/	/
	MCS3	13.82	/	/
	MCS4	13.47	/	/
	MCS5	13.50	/	/
	MCS6	13.05	/	/
	MCS7	13.05	/	/
	MCS8	13.89	/	/

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

802.11n-HT40 mode

Mode	Data Rate (Index)	Test Result (dBm)	
		5755MHz (Ch151)	5795MHz (Ch159)
802.11n (40MHz)	MCS0	14.08	/
	MCS1	14.09	14.21
	MCS2	14.01	/
	MCS3	14.02	/
	MCS4	13.39	/
	MCS5	13.44	/
	MCS6	13.53	/
	MCS7	13.50	/

The data rate MCS1 is selected as worse condition, and the following cases are performed with this condition.

802.11ac-HT40 mode

Mode	Data Rate (Index)	Test Result (dBm)	
		5755MHz (Ch151)	5795MHz (Ch159)
802.11ac (40MHz)	MCS0	13.98	14.06
	MCS1	13.95	/
	MCS2	12.93	/
	MCS3	12.89	/
	MCS4	12.51	/
	MCS5	12.50	/
	MCS6	12.01	/
	MCS7	11.96	/
	MCS8	12.80	/
	MCS9	12.71	/

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

802.11ac-HT80 mode

Mode	Data Rate (Index)	Test Result (dBm)
		5775MHz (Ch155)
802.11ac (80MHz)	MCS0	13.12
	MCS1	13.20
	MCS2	12.05
	MCS3	12.02
	MCS4	11.54
	MCS5	11.54
	MCS6	11.30
	MCS7	11.29
	MCS8	11.84
	MCS9	11.78

The data rate MCS1 is selected as worse condition, and the following cases are performed with this condition.

The spot check result of average output power is 15.17dBm (802.11n-HT20 MCS0 ch149 prototype result: 15.81dBm).

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	0.27	P
	157	-0.14	P
	165	-0.25	P
802.11n HT20	149	0.37	P
	157	0.12	P
	165	-0.08	P
802.11n HT40	151	-4.48	P
	159	-3.80	P
802.11ac HT80	155	-8.23	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 (MHz)		conclusion
802.11a	149	Fig.1	16.40	P
	157	Fig.2	16.45	P
	165	Fig.3	16.45	P
802.11n HT20	149	Fig.4	17.55	P
	157	Fig.5	17.55	P
	165	Fig.6	17.55	P
802.11n HT40	151	Fig.7	36.32	P
	159	Fig.8	36.32	P
802.11ac HT80	155	Fig.9	75.68	P

Conclusion: PASS

Test graphs as below:

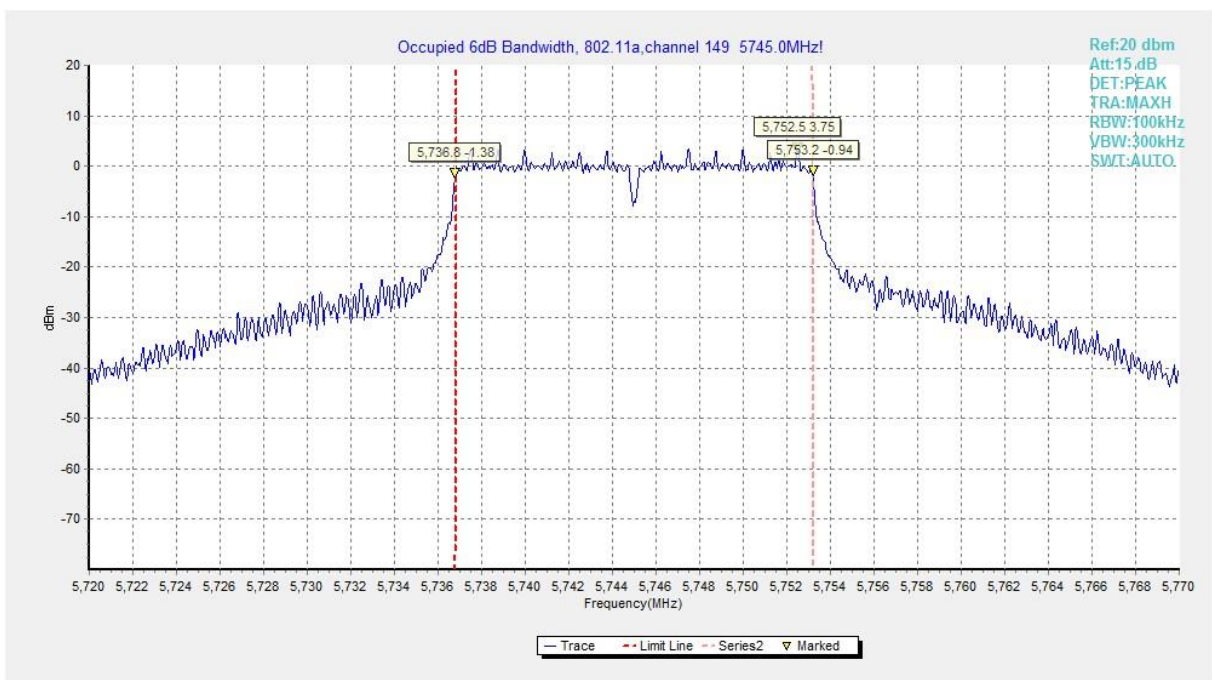


Fig. 1 Occupied 6dB Bandwidth (802.11a, Ch 149)

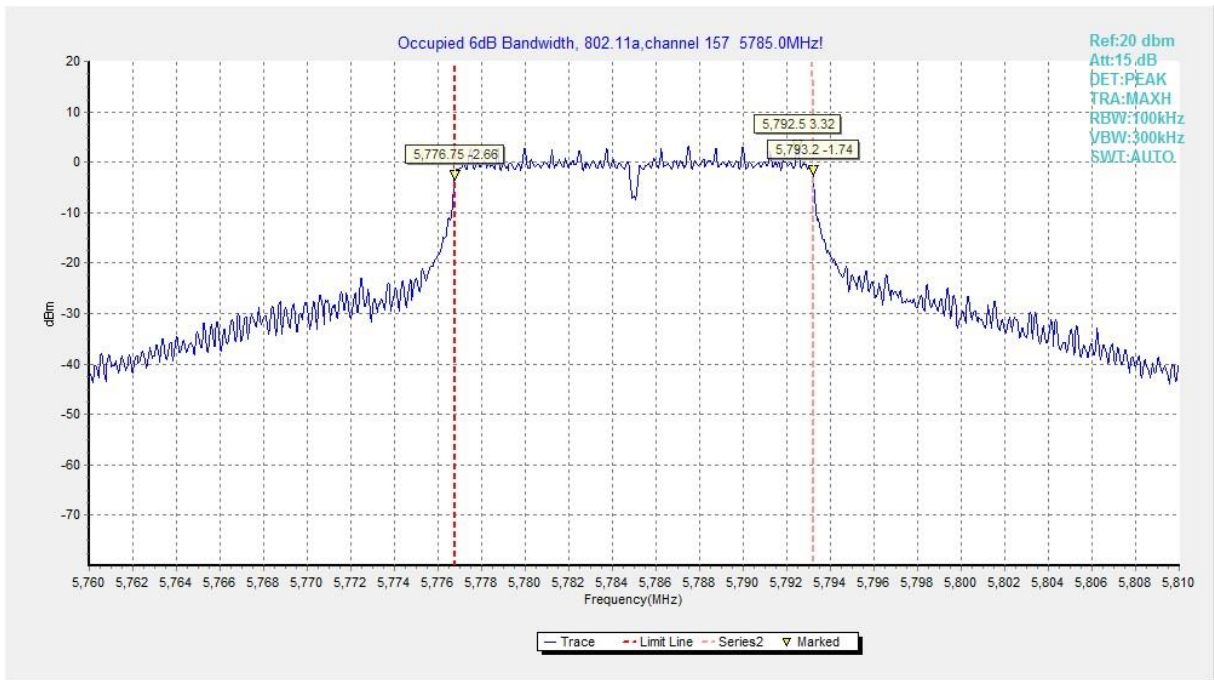


Fig. 2 Occupied 6dB Bandwidth (802.11a, Ch 157)

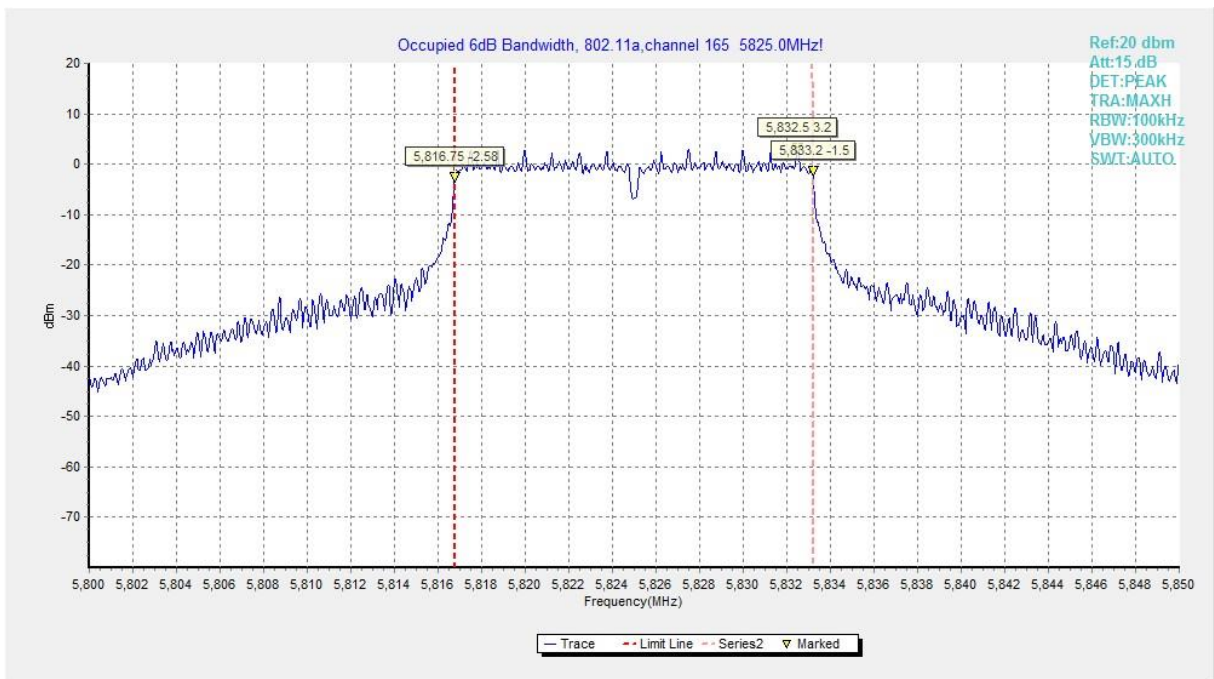


Fig. 3 Occupied 6dB Bandwidth (802.11a, Ch 165)

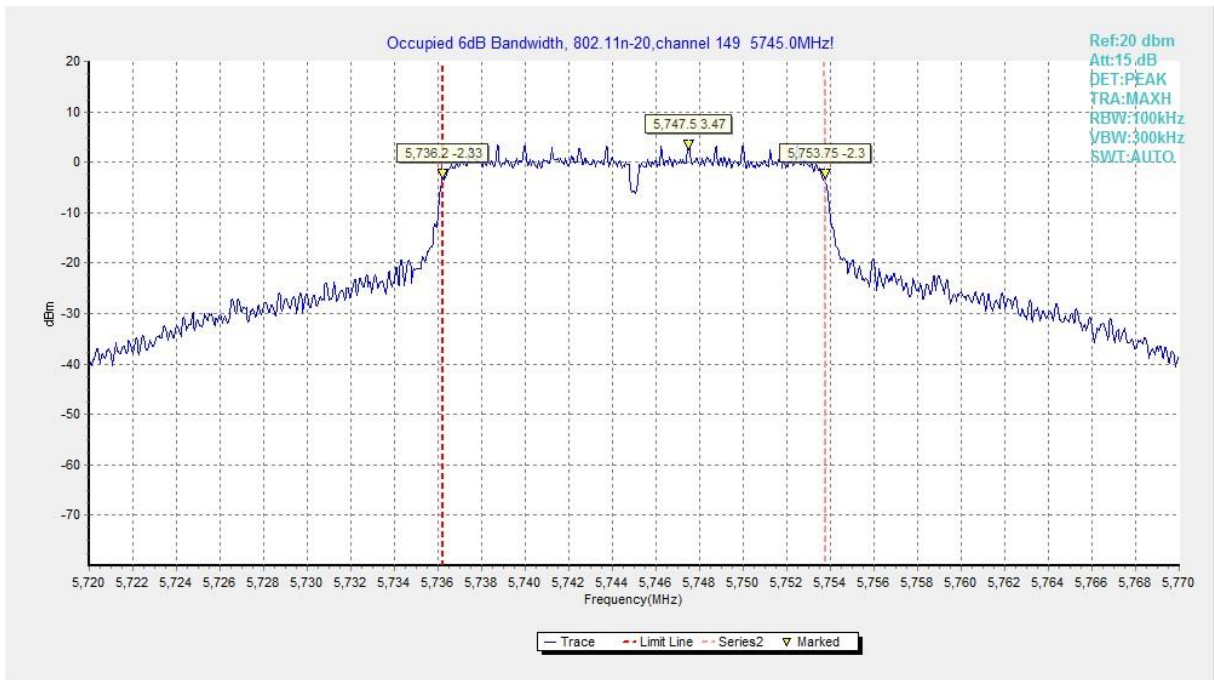


Fig. 4 Occupied 6dB Bandwidth (802.11n-HT20, Ch 149)

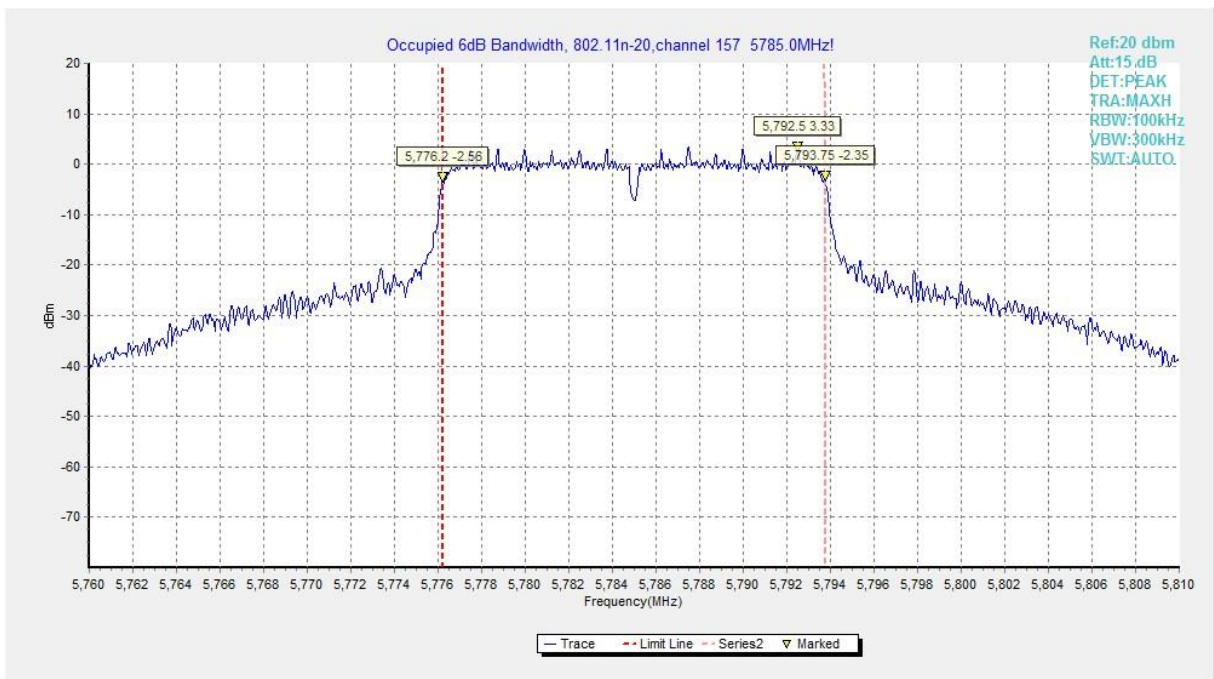


Fig. 5 Occupied 6dB Bandwidth (802.11n-HT20, Ch 157)

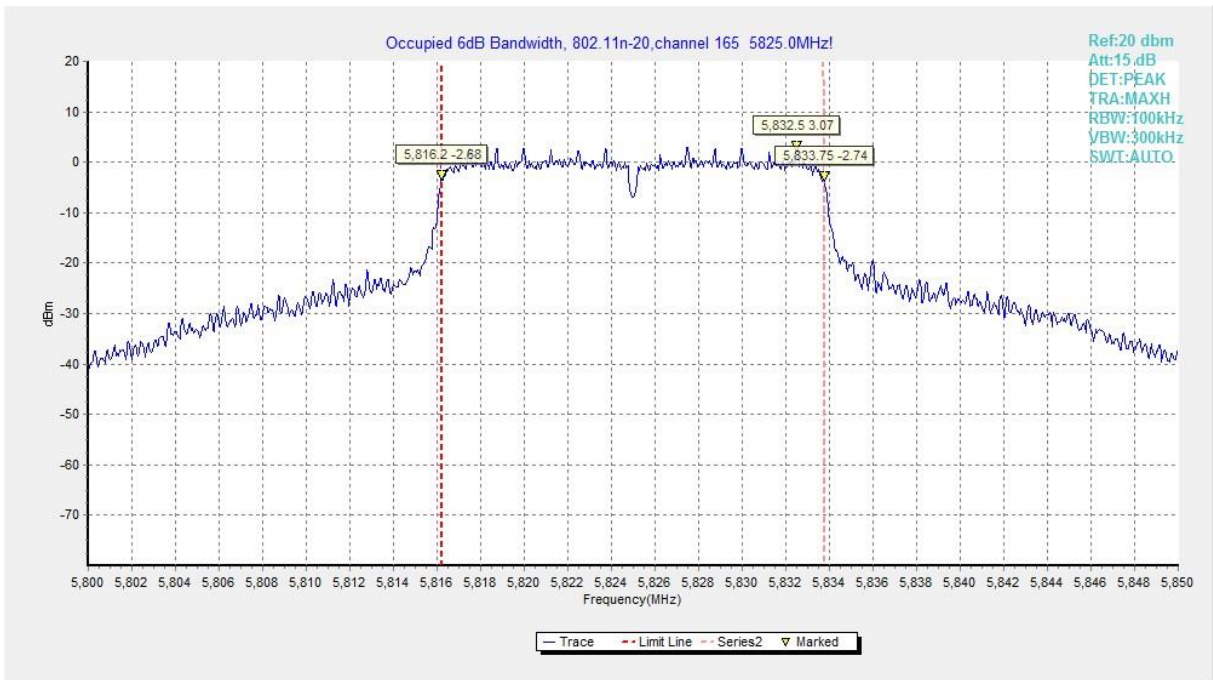


Fig. 6 Occupied 6dB Bandwidth (802.11n-HT20, Ch 165)

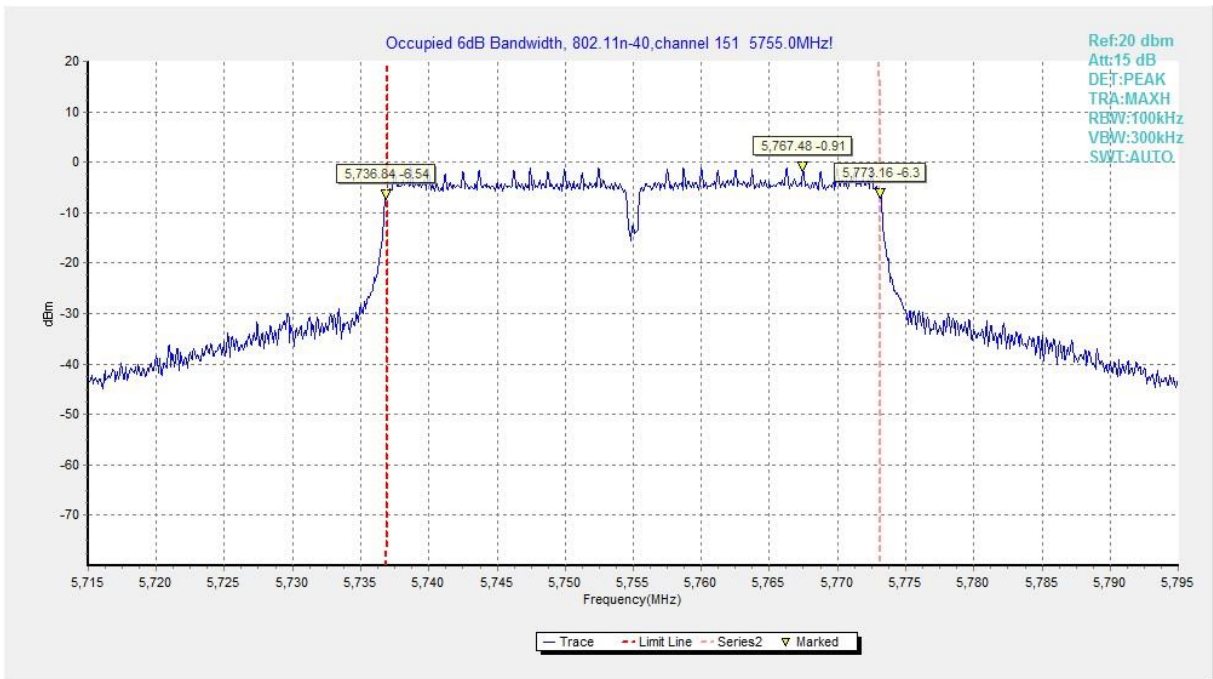


Fig. 7 Occupied 6dB Bandwidth (802.11n-HT40, Ch 151)

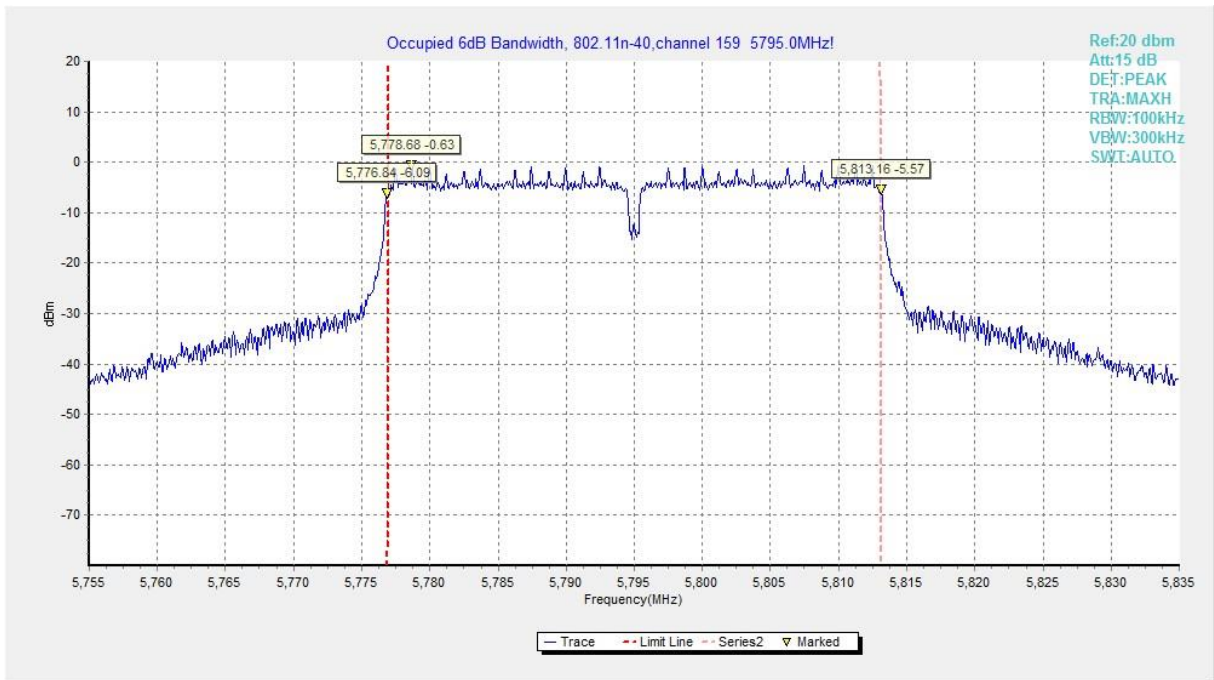


Fig. 8 Occupied 6dB Bandwidth (802.11n-HT40, Ch 159)

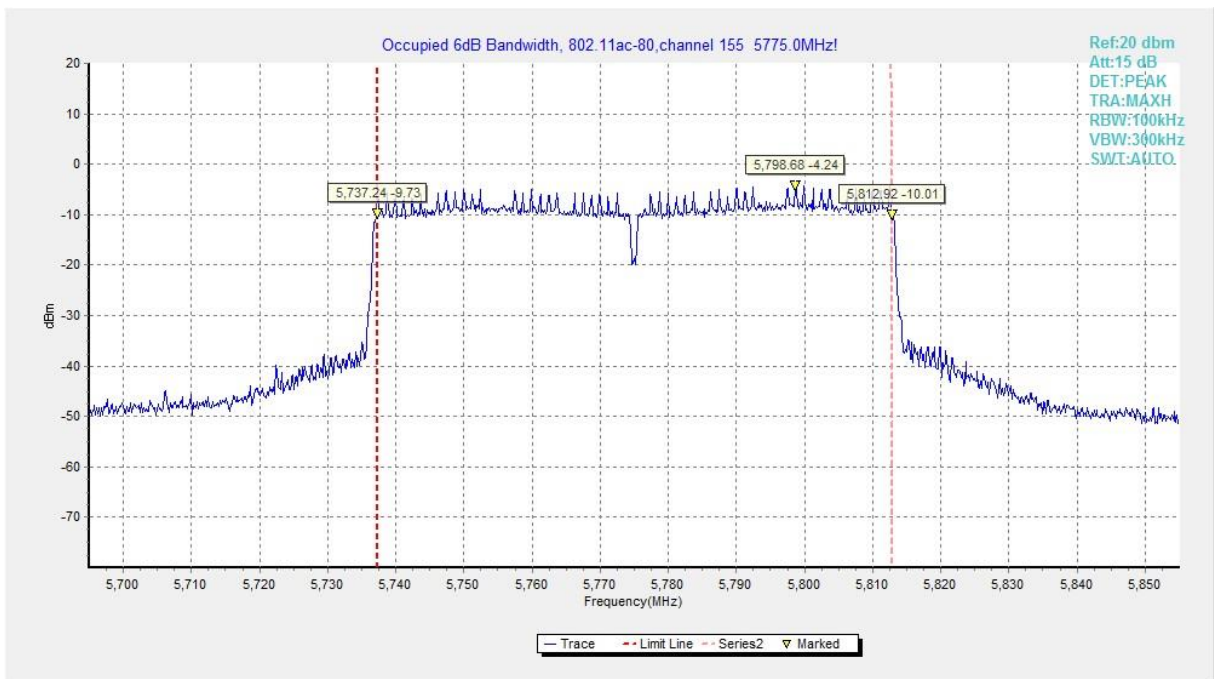


Fig. 9 Occupied 6dB Bandwidth (802.11ac-HT80, Ch 155)

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)).

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

A.5.1 Transmitter Spurious Emission - 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

Radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

Limit in restricted band:

Frequency (MHz)	Field strength(μV/m)	Measurement distance (m)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30

Frequency of emission (MHz)	Field strength (uV/m)	Field strength (dBuV/m)	Measurement distance (m)
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

Set up:

Tabletop devices shall be placed on a nonconducting platform with nominal top surface dimensions 1 m by 1.5 m. For emissions testing at or below 1 GHz, the table height shall be 80 cm above the reference ground plane. For emission measurements above 1 GHz, the table height shall be 1.5 m

The EUT and transmitting antenna shall be centered on the turntable.

Test Procedure

The EUT was placed on a non-conductive table. The measurement antenna was placed at a distance of 3 meters from the EUT. The test is carried out on both vertical and horizontal polarization and only maximization result of both polarizations is kept. During the test, the turntable is rotated 360° and the measurement antenna is moved from 1m to 4m to get the maximization result. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.

The receiver references:

Frequency of emission (MHz)	RBW/VBW	Sweep Time(s)
30-1000	100kHz/300kHz	5
1000-4000	1MHz/3MHz	15
4000-18000	1MHz/3MHz	40
18000-26500	1MHz/3MHz	20

Spot check Measurement Results:

802.11a mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11a	149	1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
		7 GHz ~ 18 GHz	---	P

Reference Measurement Results:

802.11a mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11a	149	1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
		7 GHz ~ 18 GHz	---	P

	157	9kHz ~30 MHz	---	P
		30 MHz ~1 GHz	---	P
		1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
		7 GHz ~ 18 GHz	---	P
		18 GHz ~ 26.5 GHz	---	P
		26.5 GHz~ 40 GHz	---	P
	165	1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
		7 GHz ~ 18 GHz	---	P

802.11n-HT20 mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11n (HT20)	149	1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
		7 GHz ~ 18 GHz	---	P
	157	9kHz ~30 MHz	---	P
		30 MHz ~1 GHz	---	P
		1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
		7 GHz ~ 18 GHz	---	P
		18 GHz ~ 26.5 GHz	---	P
		26.5 GHz~ 40 GHz	---	P
	165	1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
		7 GHz ~ 18 GHz	---	P

802.11n-HT40 mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11n (HT40)	151	9kHz ~30 MHz	---	P
		30 MHz ~1 GHz	---	P
		1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
		7 GHz ~ 18 GHz	---	P
		18 GHz ~ 26.5 GHz	---	P
		26.5 GHz~ 40 GHz	---	P
	159	1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
		7 GHz ~ 18 GHz	---	P

802.11ac-HT20 mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11ac (HT20)	149	1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P

	157	7 GHz ~ 18 GHz	---	P
		9kHz ~30 MHz	---	P
		30 MHz ~1 GHz	---	P
		1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
		7 GHz ~ 18 GHz	---	P
		18 GHz ~ 26.5 GHz	---	P
		26.5 GHz~ 40 GHz	---	P
	165	1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
7 GHz ~ 18 GHz		---	P	

802.11ac-HT40 mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11ac (HT40)	151	9kHz ~30 MHz	---	P
		30 MHz ~1 GHz	---	P
		1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
		7 GHz ~ 18 GHz	---	P
		18 GHz ~ 26.5 GHz	---	P
		26.5 GHz~ 40 GHz	---	P
	159	1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
		7 GHz ~ 18 GHz	---	P

802.11ac-HT80 mode

Mode	Channel	Frequency Range	Test Results	Conclusion
802.11ac (HT80)	155	9kHz ~30 MHz	---	P
		30 MHz ~1 GHz	---	P
		1 GHz ~ 3 GHz	---	P
		3 GHz ~ 7 GHz	---	P
		7 GHz ~ 18 GHz	---	P
		18 GHz ~ 26.5 GHz	---	P
		26.5 GHz~ 40 GHz	---	P

Note:

A "reference path loss" is established and the A_{Rpl} is the attenuation of "reference path loss", and including the gain of receive antenna, the gain of the preamplifier, the cable loss.

P_{Mea} is the field strength recorded from the instrument.

The measurement results are obtained as described below:

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

Spot check Measurement Results:

Average Results:

802.11a

Channel 149

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
4595.64	47.23	-19.5	33.8	32.93	54.0	6.77	V
5361.05	42.55	-18.6	34.4	26.75	54.0	11.45	H
11489.50	36.68	-25.5	38.2	23.98	54.0	17.32	V
16145.70	40.8	-21.2	40.8	21.2	54.0	13.2	V
17789.70	40.15	-20.3	40.5	19.95	54.0	13.85	V
17831.20	39.12	-20.4	40.4	19.12	54.0	14.88	V

Peak Results:

802.11a

Channel 149

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
5651.55	57.89	-18.2	34.7	41.39	69.4	11.51	H
5661.55	57.78	-18.1	34.7	41.18	76.7	18.92	V
11491.20	47.34	-25.5	38.2	34.64	74.0	26.66	V
16514.80	54.78	-20.4	41.2	33.98	68.3	13.52	H
16797.75	56.54	-20.4	41.2	35.74	68.3	11.76	V
17235.75	53.31	-20.3	41	32.61	68.3	14.99	V

Reference Measurement Results

Average Results:

802.11a

Channel 149

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
4596.000	47.7	-19.5	33.8	33.33	54.0	6.3	V
5360.500	42.9	-18.6	34.4	27.15	54.0	11.1	V
11490.400	37.0	-25.5	38.2	24.28	54.0	17.0	V
16144.800	39.8	-21.2	40.8	20.20	54.0	14.2	H
17792.800	40.4	-20.3	40.5	20.25	54.0	13.6	H
17830.400	40.2	-20.4	40.4	20.20	54.0	13.8	V

Channel 157

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
4628.000	48.4	-19.3	33.9	33.92	54.0	5.6	V
5355.125	42.8	-18.6	34.4	26.98	54.0	11.2	V
11570.400	36.7	-25.2	38.3	23.68	54.0	17.3	V
16190.400	39.9	-21.2	40.9	20.15	54.0	14.1	V
17763.200	40.3	-20.4	40.5	20.18	54.0	13.7	H
17824.800	40.3	-20.4	40.4	20.19	54.0	13.8	V

Channel 165

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
4660.000	48.6	-19.2	33.9	33.99	54.0	5.4	V
5352.625	44.4	-18.6	34.4	28.61	54.0	9.6	V
11650.400	37.0	-25.1	38.4	23.69	54.0	17.0	V
16184.000	39.8	-21.2	40.9	20.12	54.0	14.2	V
17768.800	40.3	-20.4	40.5	20.21	54.0	13.7	H
17818.400	40.2	-20.3	40.4	20.14	54.0	13.8	V

802.11n-HT20

Channel 149

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
4595.875	45.5	-19.5	33.8	31.13	54.0	8.5	V
5364.875	42.9	-18.6	34.4	27.11	54.0	11.1	V
11490.400	36.6	-25.5	38.2	23.95	54.0	17.4	V
16186.400	39.8	-21.2	40.9	20.08	54.0	14.2	H
17753.600	40.3	-20.4	40.5	20.20	54.0	13.7	V
17797.600	40.4	-20.3	40.5	20.25	54.0	13.6	H

Channel 157

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
4627.875	48.5	-19.3	33.9	33.98	54.0	5.5	V
5364.625	43.0	-18.6	34.4	27.27	54.0	11.0	V
11570.400	37.2	-25.2	38.3	24.19	54.0	16.8	V
16190.400	39.9	-21.2	40.9	20.17	54.0	14.1	H
17748.000	40.2	-20.5	40.5	20.17	54.0	13.8	V
17793.600	40.4	-20.3	40.5	20.21	54.0	13.6	V

Channel 165

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
4659.875	48.6	-19.2	33.9	34.01	54.0	5.4	V
5352.500	44.2	-18.6	34.4	28.43	54.0	9.8	V
11650.400	36.8	-25.1	38.4	23.49	54.0	17.2	H
16152.800	39.7	-21.2	40.9	20.03	54.0	14.3	V
17775.200	40.3	-20.4	40.5	20.14	54.0	13.7	V
17837.600	40.2	-20.4	40.4	20.24	54.0	13.8	V

802.11n-HT40

Channel 151

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
4604.000	45.2	-19.5	33.8	30.87	54.0	8.8	V
5353.000	42.7	-18.6	34.4	26.95	54.0	11.3	V
11510.400	36.6	-25.4	38.2	23.77	54.0	17.4	H
16147.200	39.6	-21.2	40.8	20.00	54.0	14.4	H
17768.000	40.2	-20.4	40.5	20.12	54.0	13.8	H
17838.400	40.2	-20.4	40.4	20.22	54.0	13.8	H

Channel 159

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
4636.000	48.2	-19.3	33.9	33.62	54.0	5.8	V
5355.625	42.7	-18.6	34.4	26.94	54.0	11.3	V
11590.400	36.5	-25.2	38.3	23.39	54.0	17.5	H
16163.200	39.6	-21.2	40.9	19.92	54.0	14.4	V
17792.800	40.3	-20.3	40.5	20.08	54.0	13.7	V
17830.400	40.2	-20.4	40.4	20.14	54.0	13.8	H

802.11ac-HT20

Channel 149

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
4596.000	46.4	-19.5	33.8	32.04	54.0	7.6	V
5359.000	42.9	-18.6	34.4	27.10	54.0	11.1	V
11490.400	36.8	-25.5	38.2	24.07	54.0	17.2	V
16185.600	39.6	-21.2	40.9	19.87	54.0	14.4	V
17738.400	40.0	-20.5	40.5	19.97	54.0	14.0	V
17795.200	40.2	-20.3	40.5	20.06	54.0	13.8	H

Channel 157

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
4627.875	48.3	-19.3	33.9	33.80	54.0	5.7	V
5364.500	42.9	-18.6	34.4	27.12	54.0	11.1	V
11570.400	36.4	-25.2	38.3	23.34	54.0	17.6	H
16185.600	39.6	-21.2	40.9	19.90	54.0	14.4	H
17763.200	40.2	-20.4	40.5	20.07	54.0	13.8	V
17824.800	40.1	-20.4	40.4	20.00	54.0	13.9	H

Channel 165

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
4659.875	49.0	-19.2	33.9	34.43	54.0	5.0	V
5353.000	44.5	-18.6	34.4	28.66	54.0	9.5	V
11650.400	37.0	-25.1	38.4	23.62	54.0	17.0	H
16185.600	39.6	-21.2	40.9	19.89	54.0	14.4	H
17756.800	40.1	-20.4	40.5	20.02	54.0	13.9	H
17804.000	40.0	-20.3	40.5	19.82	54.0	14.0	V

802.11ac-HT40

Channel 151

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
4603.875	46.4	-19.5	33.8	32.08	54.0	7.6	V
5358.750	42.9	-18.6	34.4	27.13	54.0	11.1	V
11510.400	36.3	-25.4	38.2	23.47	54.0	17.7	V
16152.000	39.7	-21.2	40.9	20.02	54.0	14.3	H
17792.000	40.2	-20.3	40.5	20.07	54.0	13.8	H
17830.400	40.1	-20.4	40.4	20.10	54.0	13.9	H

Channel 159

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
4636.000	48.2	-19.3	33.9	33.62	54.0	5.8	V
5355.625	42.7	-18.6	34.4	26.94	54.0	11.3	V
11590.400	36.5	-25.2	38.3	23.39	54.0	17.5	H
16163.200	39.6	-21.2	40.9	19.92	54.0	14.4	V
17792.800	40.3	-20.3	40.5	20.08	54.0	13.7	V
17830.400	40.2	-20.4	40.4	20.14	54.0	13.8	H

802.11ac-HT80

Channel 155

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
4620.125	48.5	-19.4	33.9	34.08	54.0	5.5	V
5368.000	45.6	-18.6	34.4	29.91	54.0	8.4	V
11550.400	36.3	-25.3	38.3	23.32	54.0	17.7	H
16187.200	39.8	-21.2	40.9	20.07	54.0	14.2	H
17784.000	40.4	-20.3	40.5	20.30	54.0	13.6	V
17818.400	40.2	-20.3	40.4	20.12	54.0	13.8	V

Peak Results:
802.11a

Channel 149

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
5651.646	57.9	-18.2	34.7	41.48	69.4	11.5	H
5661.450	59.6	-18.1	34.7	43.04	76.7	17.1	H
11490.200	48.6	-25.5	38.2	35.94	74.0	25.4	V
16513.900	55.0	-20.4	41.2	34.22	68.3	13.3	H
16793.850	55.6	-20.4	41.2	34.74	68.3	12.7	V
17234.950	52.7	-20.3	41.0	31.97	68.3	15.6	V

Channel 157

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
5742.500	61.5	-17.6	34.8	44.32	68.3	6.8	V
5880.750	61.4	-17.6	35.0	44.06	68.3	6.9	H
11569.950	49.1	-25.2	38.3	36.04	74.0	24.9	V
16952.800	55.7	-20.5	41.2	35.04	68.3	12.6	H
17029.800	55.8	-20.8	41.2	35.38	68.3	12.5	V
17354.850	52.5	-20.1	40.8	31.80	68.3	15.8	H

Channel 165

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
5922.190	58.8	-17.7	35.0	41.53	70.3	11.4	H
5924.317	58.6	-17.7	35.0	41.26	68.7	10.1	V
11650.250	49.5	-25.1	38.4	36.15	74.0	24.5	V
16852.700	55.4	-20.2	41.2	34.42	68.3	12.9	V
16907.700	55.5	-20.1	41.2	34.50	68.3	12.8	H
17474.750	52.8	-20.5	40.7	32.57	68.3	15.5	V

802.11n-HT20

Channel 149

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
5650.381	58.1	-18.2	34.7	41.69	68.5	10.4	H
5653.012	58.2	-18.2	34.7	41.70	70.4	12.3	H
11490.200	48.3	-25.5	38.2	35.63	74.0	25.7	H
16814.200	55.6	-20.4	41.2	34.79	68.3	12.7	V
16922.000	55.6	-20.3	41.2	34.66	68.3	12.7	V
17234.950	52.8	-20.3	41.0	32.15	68.3	15.5	V

Channel 157

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
5735.875	61.5	-17.7	34.8	44.31	68.3	6.8	H
5869.500	61.1	-17.5	34.9	43.68	68.3	7.2	H
11569.950	48.3	-25.2	38.3	35.28	74.0	25.7	H
16715.200	54.4	-20.2	41.2	33.48	68.3	13.9	V
16861.500	54.8	-20.2	41.2	33.83	68.3	13.5	H
17354.850	52.3	-20.1	40.8	31.61	68.3	16.0	H

Channel 165

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
5921.960	58.5	-17.7	35.0	41.21	70.4	11.9	V
5924.353	58.6	-17.7	35.0	41.27	68.7	10.1	H
11650.250	48.4	-25.1	38.4	35.05	74.0	25.6	H
16872.500	55.3	-20.2	41.2	34.28	68.3	13.0	V
17216.250	55.5	-20.3	41.0	34.85	68.3	12.8	H
17474.750	52.1	-20.5	40.7	31.88	68.3	16.2	V

802.11n-HT40

Channel 151

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
5650.740	57.4	-18.2	34.7	40.92	68.7	11.4	V
5653.982	58.3	-18.2	34.7	41.82	71.1	12.8	V
11510.000	47.7	-25.4	38.2	34.88	74.0	26.3	H
16876.350	56.5	-20.2	41.2	35.42	68.3	11.8	V
16923.100	54.9	-20.3	41.2	33.96	68.3	13.4	V
17265.200	52.6	-20.2	40.9	31.83	68.3	15.7	H

Channel 159

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
5923.857	58.6	-17.7	35.0	41.28	69.0	10.4	H
5924.619	58.8	-17.7	35.0	41.49	68.5	9.7	V
11589.750	47.9	-25.2	38.3	34.80	74.0	26.1	V
16645.900	55.1	-20.5	41.2	34.35	68.3	13.2	H
16859.850	55.3	-20.2	41.2	34.30	68.3	13.0	H
17385.100	52.3	-20.2	40.8	31.62	68.3	16.0	V

802.11ac-HT20

Channel 149

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
5650.769	57.5	-18.2	34.7	41.03	68.8	11.3	H
5654.514	57.6	-18.2	34.7	41.14	71.5	13.9	H
11490.200	48.5	-25.5	38.2	35.78	74.0	25.5	H
16880.750	55.4	-20.1	41.2	34.30	68.3	12.9	H
17164.000	55.5	-20.4	41.0	34.90	68.3	12.8	V
17234.950	52.7	-20.3	41.0	32.01	68.3	15.6	H

Channel 157

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
5726.750	61.5	-17.7	34.8	44.44	68.3	6.8	V
5841.875	61.2	-17.4	34.9	43.64	68.3	7.1	V
11569.950	48.0	-25.2	38.3	34.94	74.0	26.0	H
16936.850	55.4	-20.4	41.2	34.54	68.3	12.9	H
17354.850	53.2	-20.1	40.8	32.48	68.3	15.1	H
17441.200	55.5	-20.4	40.8	35.07	68.3	12.8	H

Channel 165

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
5922.707	59.0	-17.7	35.0	41.69	69.9	10.9	V
5924.231	59.0	-17.7	35.0	41.65	68.8	9.8	H
11650.250	49.4	-25.1	38.4	36.00	74.0	24.6	V
16900.000	54.8	-20.1	41.2	33.73	68.3	13.5	H
17128.250	55.1	-20.5	41.1	34.47	68.3	13.2	V
17474.750	51.7	-20.5	40.7	31.46	68.3	16.6	V

802.11ac-HT40

Channel 151

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
5651.624	58.1	-18.2	34.7	41.67	69.4	11.3	V
5655.693	59.5	-18.2	34.7	43.03	72.4	12.9	H
11510.000	47.4	-25.4	38.2	34.54	74.0	26.6	V
16676.700	55.0	-20.3	41.2	34.09	68.3	13.3	V
17265.200	52.0	-20.2	40.9	31.32	68.3	16.3	H
17421.950	55.4	-20.3	40.8	34.90	68.3	12.9	V

Channel 159

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
5921.931	59.0	-17.7	35.0	41.68	70.5	11.5	H
5924.576	58.6	-17.7	35.0	41.28	68.5	9.9	V
11589.750	47.8	-25.2	38.3	34.69	74.0	26.2	H
16928.050	55.7	-20.3	41.2	34.84	68.3	12.6	V
17364.200	55.2	-20.1	40.8	34.47	68.3	13.1	H
17385.100	52.4	-20.2	40.8	31.75	68.3	15.9	H

802.11ac-HT80

Channel 155

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
5650.007	60.8	-18.2	34.7	44.34	68.3	7.5	V
5650.352	60.9	-18.2	34.7	44.46	68.5	7.6	V
11550.150	48.0	-25.3	38.3	35.01	74.0	26.0	H
16494.650	55.0	-20.4	41.2	34.18	68.3	13.3	H
16852.150	55.2	-20.2	41.2	34.23	68.3	13.1	H
17325.150	52.8	-20.1	40.9	32.08	68.3	15.5	V

A.6. Band Edges Compliance

A6.1 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.	

Set up:

Tabletop devices shall be placed on a nonconducting platform with nominal top surface dimensions 1 m by 1.5 m and the table height shall be 1.5 m.

The EUT and transmitting antenna shall be centered on the turntable.

Test Procedure

The EUT was placed on a non-conductive table. The measurement antenna was placed at a distance of 3 meters from the EUT. The test is carried out on both vertical and horizontal polarization and only maximization result of both polarizations is kept. During the test, the turntable is rotated 360° and the measurement antenna is moved from 1m to 4m to get the maximization result. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.

The receiver references:

Frequency of emission (MHz)	RBW/VBW	Sweep Time(s)
30-1000	100kHz/300kHz	5
1000-4000	1MHz/3MHz	15
4000-18000	1MHz/3MHz	40
18000-26500	1MHz/3MHz	20

Measurement Result:

Mode	Channel	Test Results	Conclusion
802.11a	5745 MHz	Fig.10	P
	5825 MHz	Fig.11	P
802.11n HT20	5745 MHz	Fig.12	P
	5825 MHz	Fig.13	P
802.11n HT40	5755 MHz	Fig.14	P
	5795 MHz	Fig.15	P
802.11ac HT20	5745 MHz	Fig.16	P
	5825 MHz	Fig.17	P
802.11ac HT40	5755 MHz	Fig.18	P
	5795 MHz	Fig.19	P
802.11ac HT80	5775 MHz	Fig.20 Fig.21	P

Conclusion: PASS

Test graphs as below:

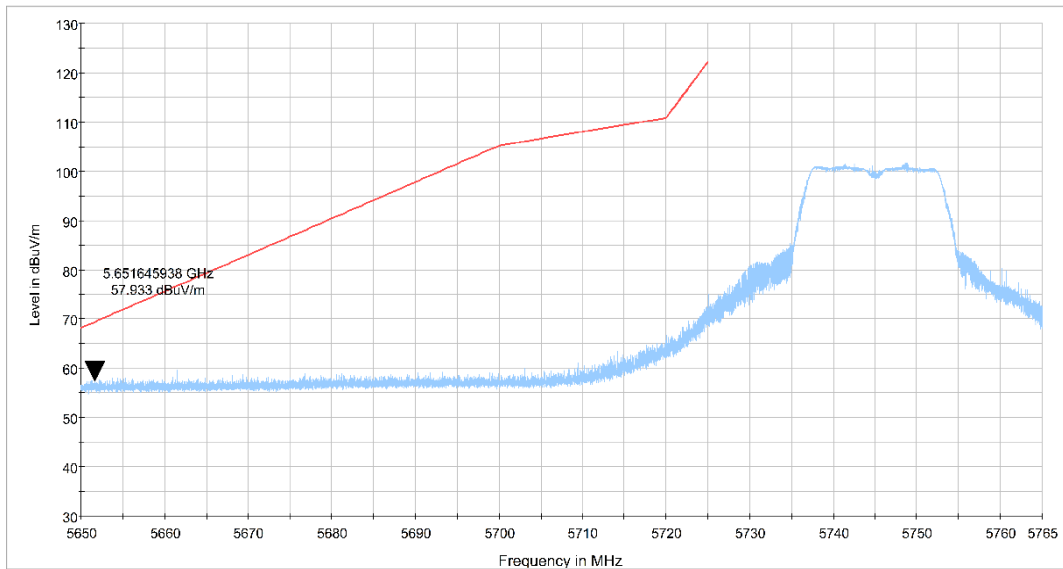


Fig. 10 Band Edges (802.11a Ch149,5745MHz)

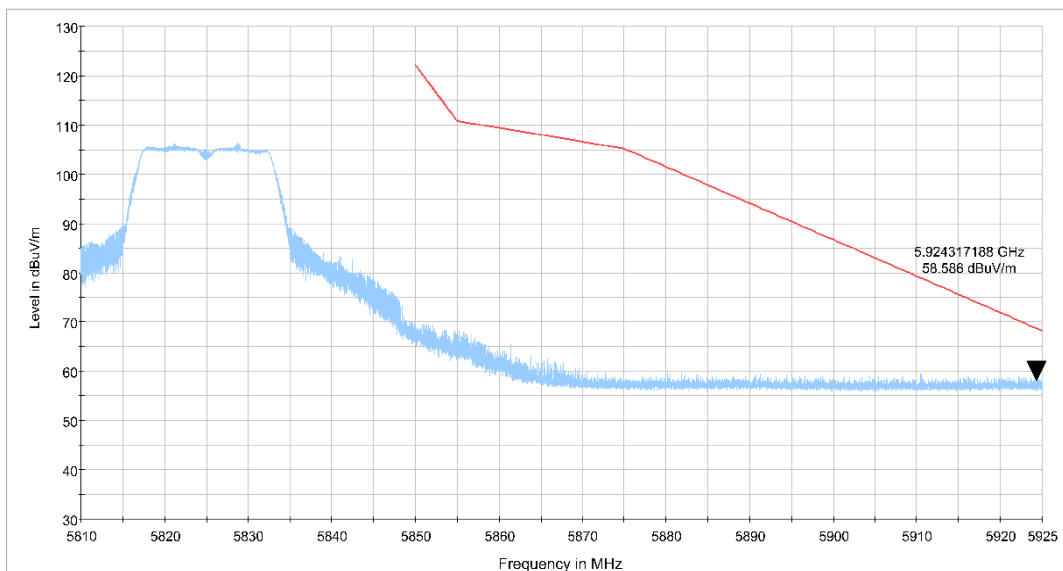


Fig. 11 Band Edges (802.11a Ch165, 5825MHz)

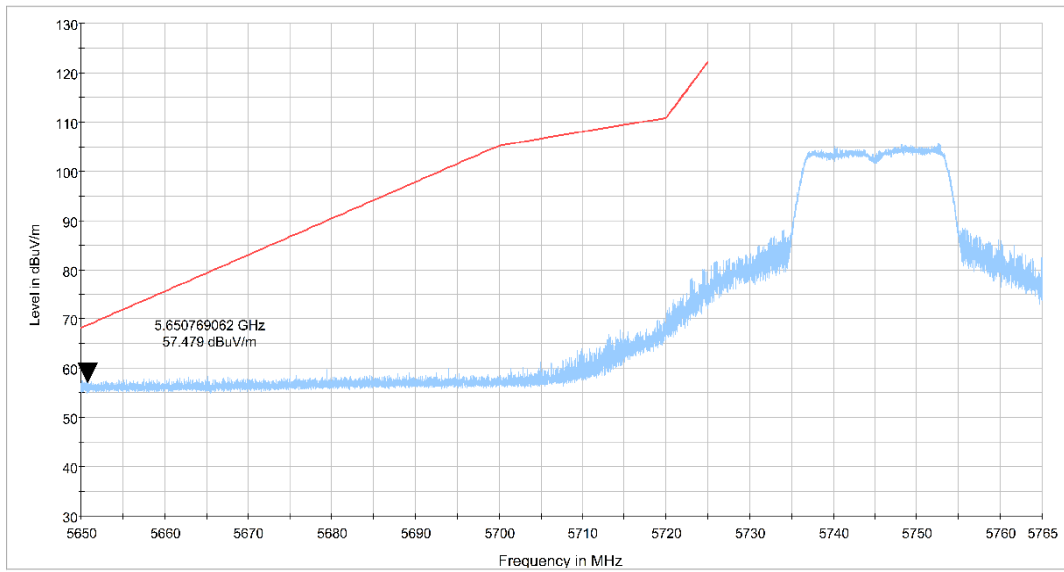


Fig. 12 Band Edges (802.11n-HT20 Ch149, 5745MHz)

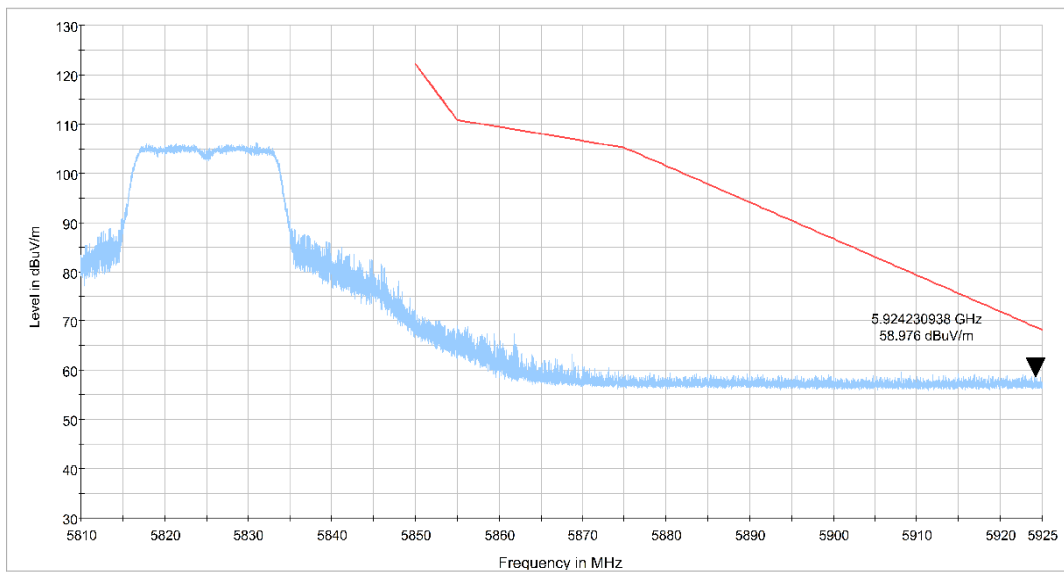


Fig. 13 Band Edges (802.11n-HT20 Ch165, 5825MHz)

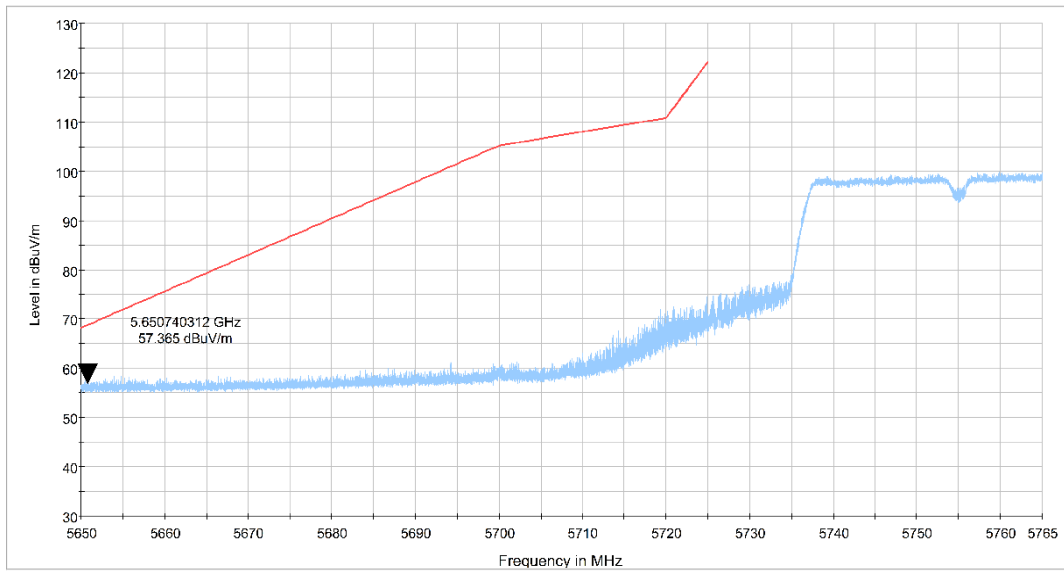


Fig. 14 Band Edges (802.11n-HT40 Ch151, 5755MHz)

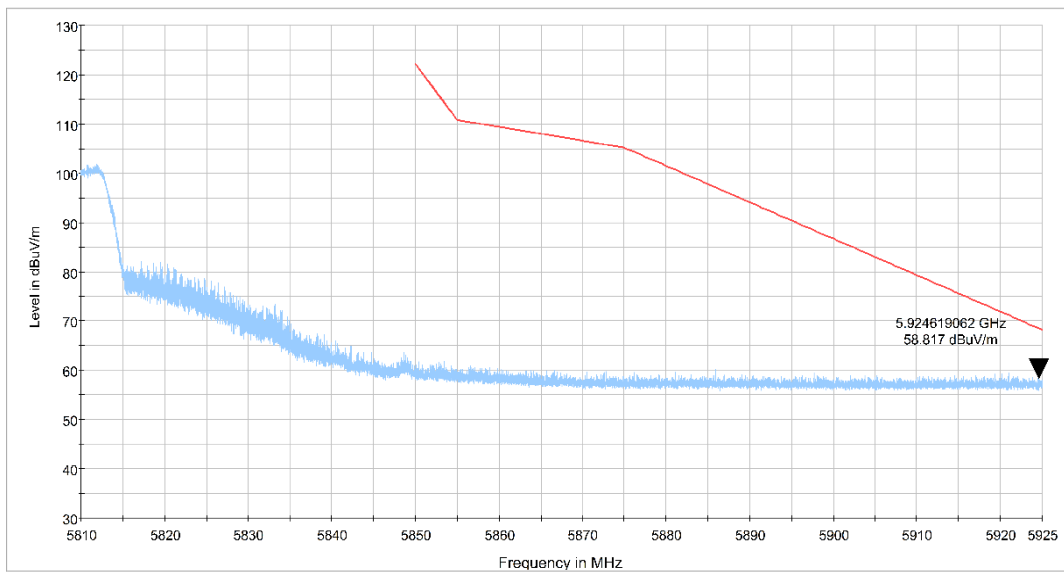


Fig. 15 Band Edges (802.11n-HT40 Ch159, 5795MHz)

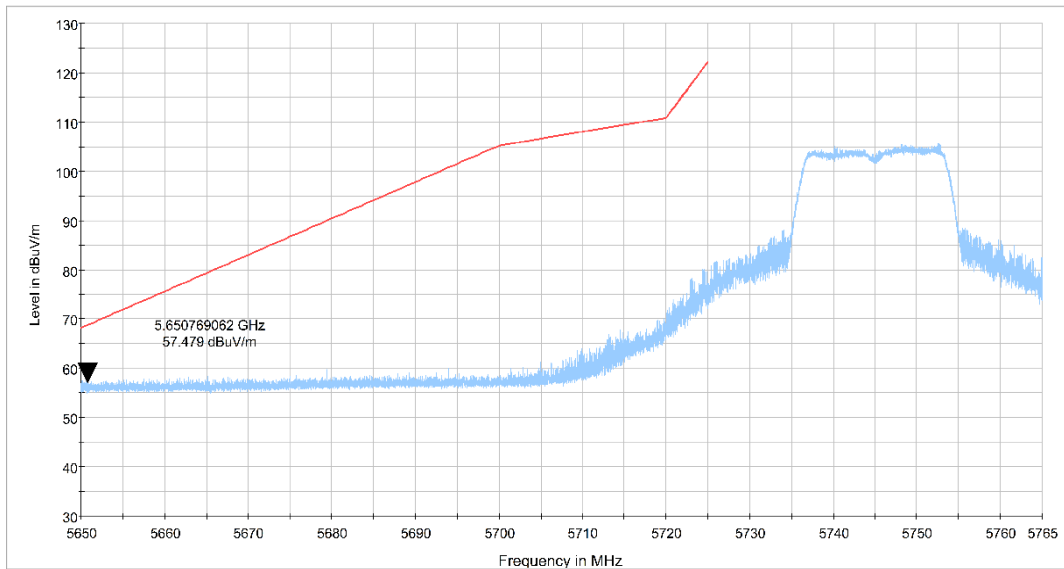


Fig. 16 Band Edges (802.11ac-HT20 Ch149, 5745MHz)

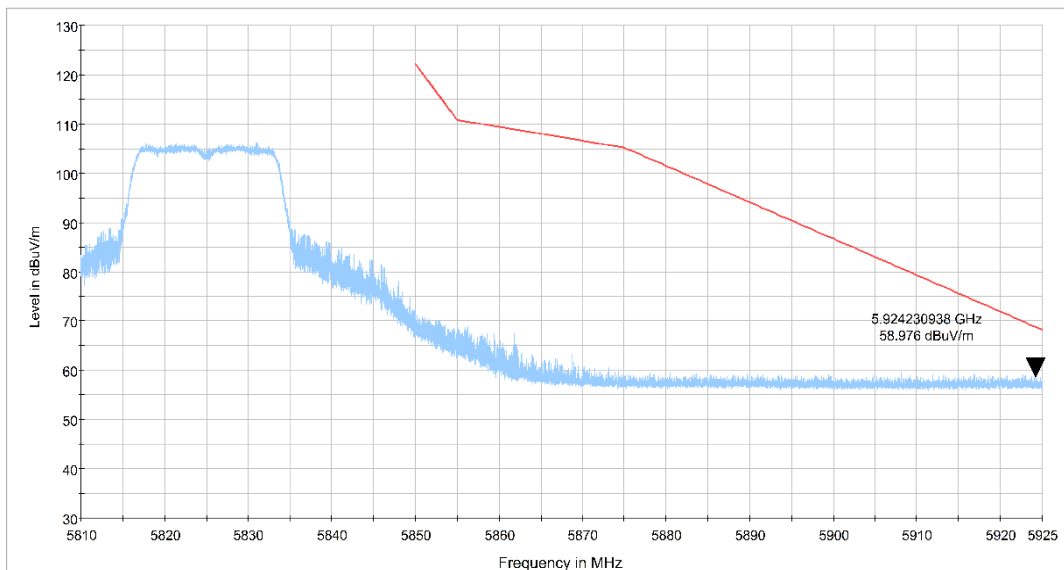


Fig. 17 Band Edges (802.11ac-HT20 Ch165, 5825MHz)

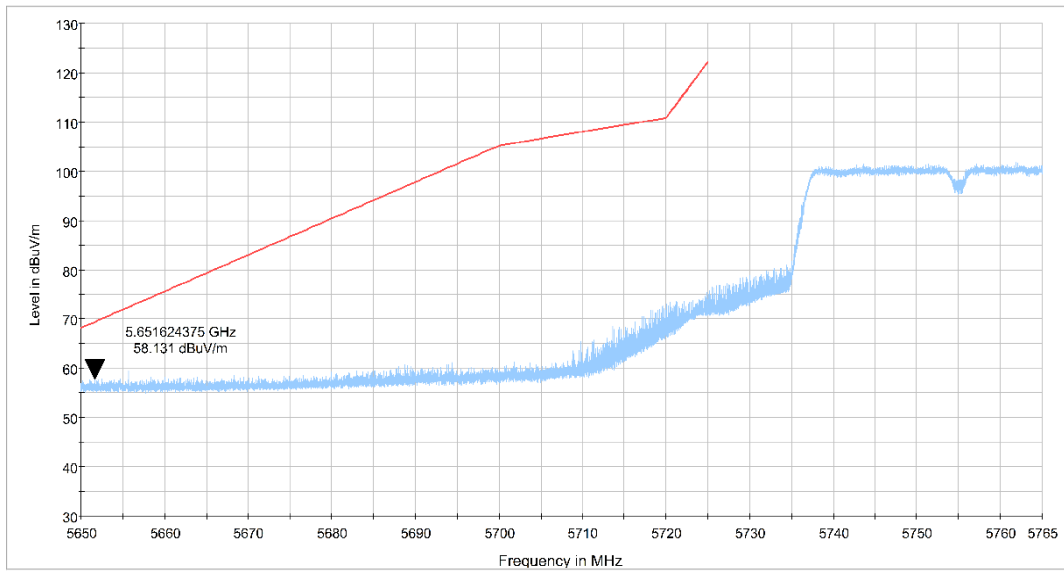


Fig. 18 Band Edges (802.11ac-HT40 Ch151, 5755MHz)

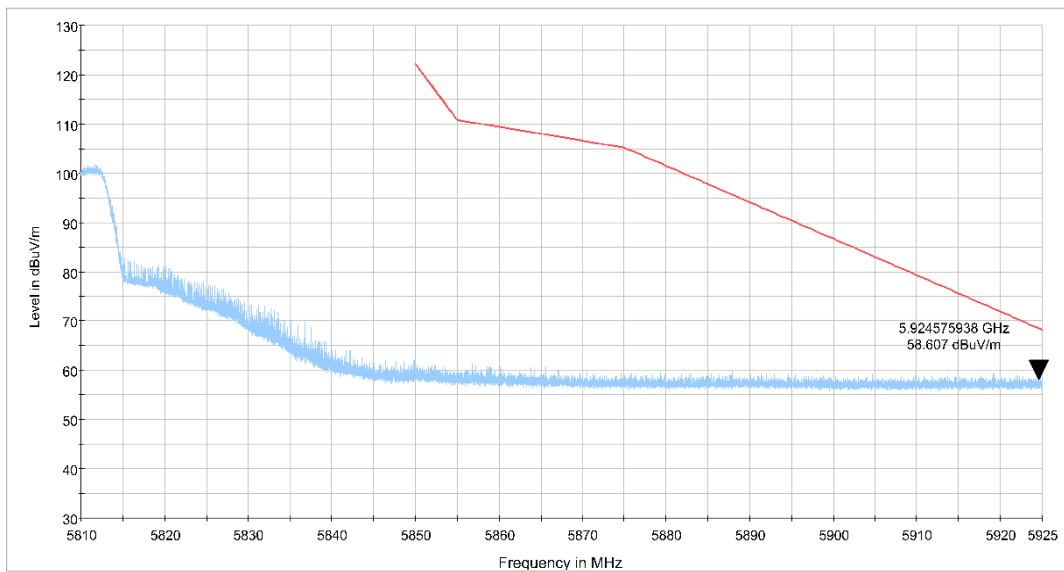


Fig. 19 Band Edges (802.11ac-HT40 Ch159, 5795MHz)

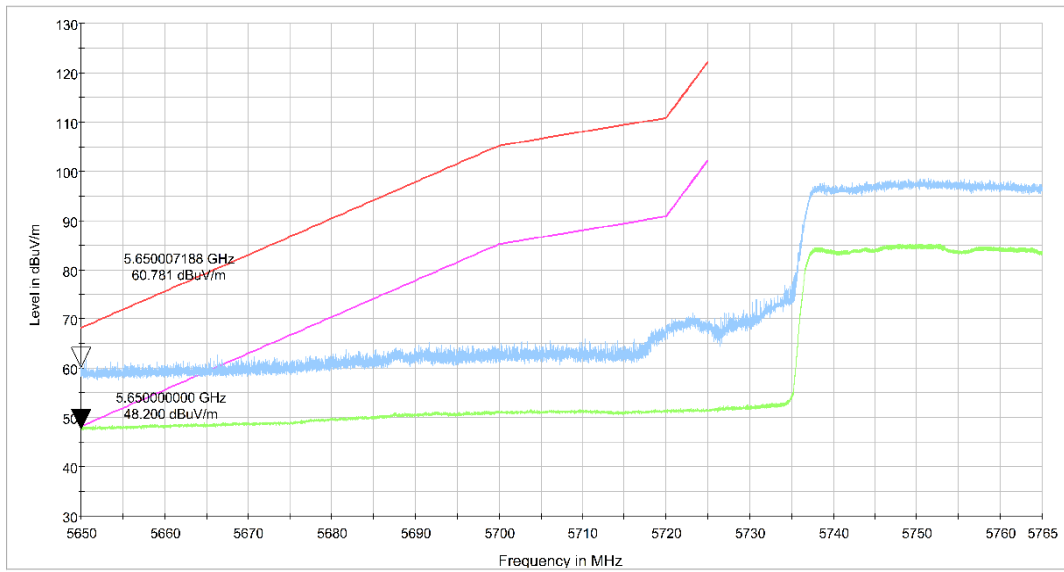


Fig. 20 Band Edges (802.11ac-HT80 Ch155, 5775MHz)

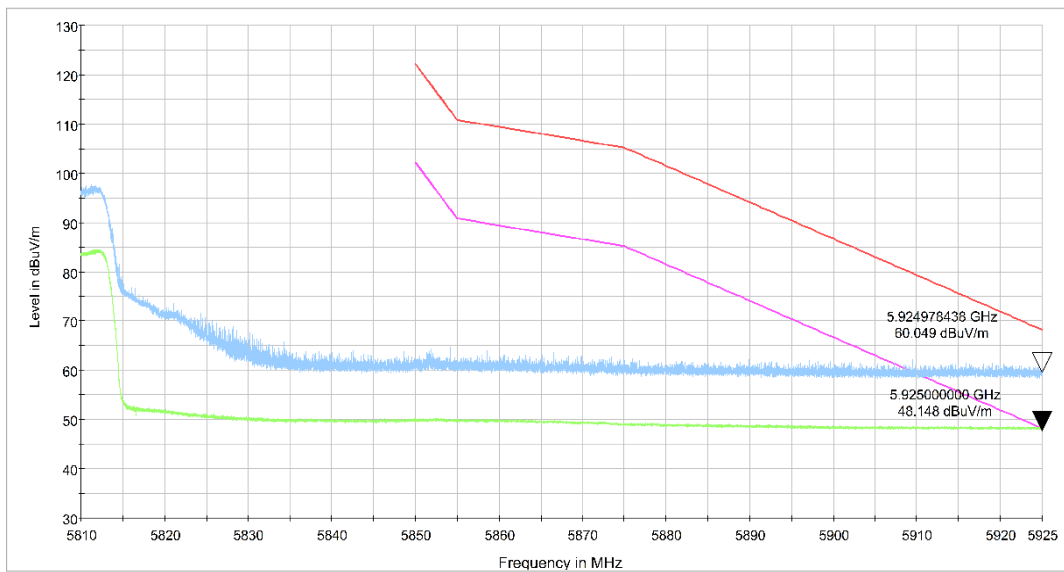


Fig. 21 Band Edges (802.11ac-HT80 Ch155, 5775MHz)

A.7. AC Powerline Conducted Emission

Method of Measurement:

See Clause 6.2 of ANSI C63.10-2013 specifically.

See Clause 4 and Clause 5 of ANSI C63.10-2013 generally.

The conducted emissions from the AC port of the EUT are measured in a shielding room. The EUT is connected to a Line Impedance Stabilization Network (LISN). An overview sweep with peak detection was performed. The measurements were performed with a quasi-peak detector and if required, an average detector.

The conducted emission measurements were made with the following detector of the test receiver: Quasi-Peak / Average Detector.

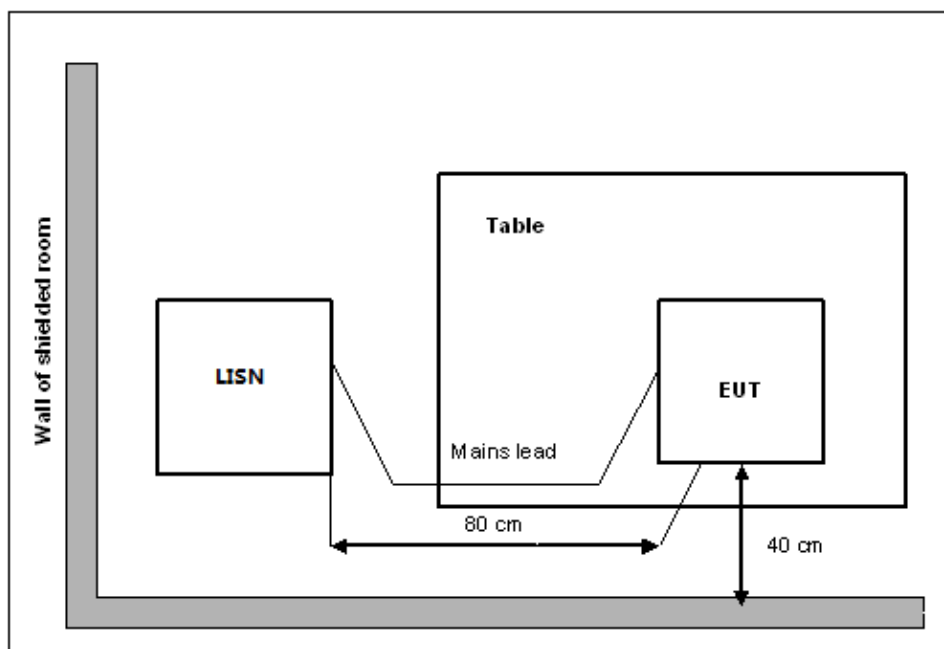
The measurement bandwidth is:

Frequency of Emission (MHz)	RBW/IF bandwidth
0.15-30	9kHz

Test Condition:

Voltage (V)	Frequency (Hz)
120	60

Measurement Setup



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.22	Fig.23	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.22	Fig.A23	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.

The measurement is made according to ANSI C63.10 .

Conclusion: PASS

Test graphs as below:

Traffic:

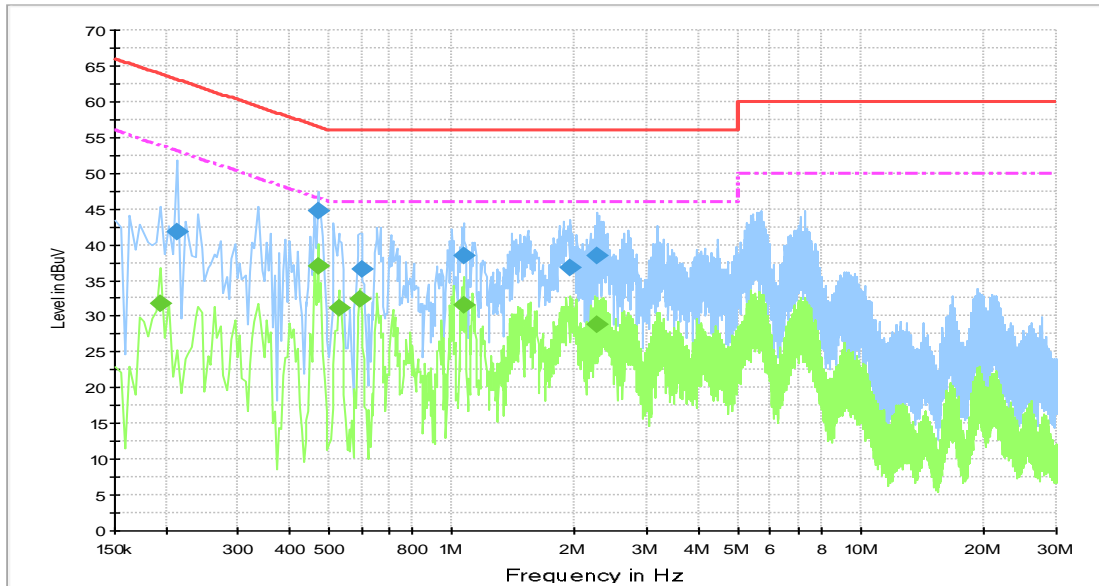


Fig. 22 AC Power line Conducted Emission-802.11a

Note1: The graphic result above is the maximum of the measurements for both phase line and neutral line.

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.213000	41.8	5000	9.000	On	N	19.9	21.3	63.1
0.469500	44.7	5000	9.000	On	L1	19.9	11.8	56.5
0.600000	36.5	5000	9.000	On	L1	19.8	19.5	56.0
1.068000	38.5	5000	9.000	On	L1	19.7	17.5	56.0
1.945500	36.8	5000	9.000	On	N	19.7	19.2	56.0
2.269500	38.5	5000	9.000	On	L1	19.6	17.5	56.0

Final Result 2

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.195000	31.8	5000	9.000	On	L1	19.9	22.0	53.8
0.469500	36.9	5000	9.000	On	L1	19.9	9.6	46.5
0.528000	31.1	5000	9.000	On	L1	19.8	14.9	46.0
0.595500	32.4	5000	9.000	On	L1	19.8	13.6	46.0
1.068000	31.6	5000	9.000	On	L1	19.7	14.4	46.0
2.269500	28.8	5000	9.000	On	L1	19.6	17.2	46.0

Idle:

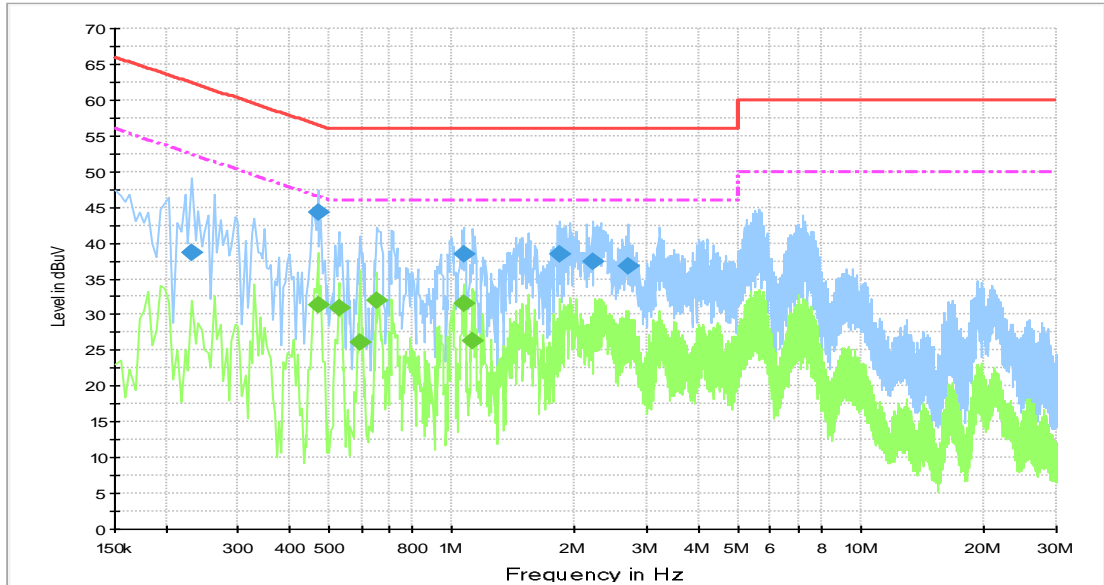


Fig. 23 AC Power line Conducted Emission-Idle

Note1: The graphic result above is the maximum of the measurements for both phase line and neutral line.

Final Result 1

Frequency (MHz)	QuasiPeak (dB μ V)	Meas. Time	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.231000	38.7	5000	9.000	On	L1	19.9	23.8	62.4
0.469500	44.2	5000	9.000	On	L1	19.9	12.3	56.5
1.068000	38.4	5000	9.000	On	L1	19.7	17.6	56.0
1.833000	38.5	5000	9.000	On	L1	19.7	17.5	56.0
2.211000	37.4	5000	9.000	On	L1	19.6	18.6	56.0
2.692500	36.7	5000	9.000	On	L1	19.6	19.3	56.0

Final Result 2

Frequency (MHz)	QuasiPeak (dB μ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.469500	31.4	5000.0	9.000	On	N	19.9	15.1	46.5
0.528000	31.0	5000.0	9.000	On	L1	19.8	15.0	46.0
0.595500	26.1	5000.0	9.000	On	N	19.8	19.9	46.0
0.654000	32.0	5000.0	9.000	On	L1	19.8	14.0	46.0
1.068000	31.5	5000.0	9.000	On	L1	19.7	14.5	46.0
1.126500	26.3	5000.0	9.000	On	N	19.7	19.7	46.0

Note: The measurement results showed here are worst cases of the combinations of different AE.

ANNEX B: EUT parameters

Disclaimer: The 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 C: Accreditation Certificate

United States Department of Commerce National Institute of Standards and Technology	
	
<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>	
2021-09-29 through 2022-09-30 <i>Effective Dates</i>	  <i>For the National Voluntary Laboratory Accreditation Program</i>

*** END OF REPORT BODY ***