FCC PART 15E
TEST REPORT
No.24T04Z101872-017

for

Xiaomi Communications Co., Ltd.

Mobile Phone

24116RACCG

FCC ID:2AFZZRACCG

with

Hardware Version: 1351000O6

Software Version: Xiaomi HyperOS 1.0

Issued Date: 2024-09-20

Note:

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

Test Laboratory:

CTTL-Telecommunication Technology Labs, CAICT

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

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REPORT HISTORY

Report Number	Revision	Description	Issue Date
24T04Z101872-017	Rev.0	1st edition	2024-09-20

Note: the latest revision of the test report supersedes all previous version.

CONTENTS

1. Test Laboratory

1.1. Introduction & Accreditation

Telecommunication Technology Labs, CAICT is an ISO/IEC 17025:2017 accredited test laboratory under American Association for Laboratory Accreditation (A2LA) with lab code 7049.01, and is also an FCC accredited test laboratory (CN1349), and ISED accredited test laboratory (CAB identifier:CN0066). The detail accreditation scope can be found on A2LA 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, 100191, P. R. China

1.3. TestingEnvironment

Normal Temperature: 15-35°C

Relative Humidity: 20-75%

1.4. Project date

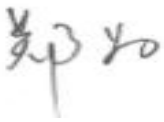
Testing Start Date: 2024-08-12

Testing End Date: 2024-09-20

1.5. Signature

Yao Xingyu

(Prepared this test report)



Zheng Wei

(Reviewed this test report)

Pang Shuai

(Approved this test report)

2. Client Information

2.1. Applicant Information

Company Name:	Xiaomi Communications Co., Ltd.
Address:	#019, 9th Floor, Building 6, 33 Xi'erqi Middle Road, Haidian District, Beijing, China, 100085
Contact Name:	Zeng Qingyao
Telephone:	010-60606666-8088
Fax:	010-60606666-1101
E-mail:	mi-compliance@xiaomi.com

2.2. Manufacturer Information

Company Name:	Xiaomi Communications Co., Ltd.
Address:	#019, 9th Floor, Building 6, 33 Xi'erqi Middle Road, Haidian District, Beijing, China, 100085
Contact Name:	Zeng Qingyao
Telephone:	010-60606666-8088
Fax:	010-60606666-1101
E-mail:	mi-compliance@xiaomi.com

3. Equipment Under Test (EUT) and Ancillary Equipment (AE)

3.1. About EUT

Description	Mobile Phone
Model name	24116RACCG
FCC ID	2AFZZRACCG
WLAN Frequency Band	ISM Band: 5725MHz~5850MHz
Type of modulation	OFDM
Nominal Voltage	3.91V
Extreme High Voltage	4.5V
Extreme Low Voltage	3.6V

3.2. Internal Identification of EUT used during the test

EUT ID*	IMEI	HW Version	SW Version	Date of receipt
UT02a	865991070018829/ 865991070018837	1351000O6	Xiaomi HyperOS 1.0	2024-08-27
UT06a	865991070068089/ 865991070068097	1351000O6	Xiaomi HyperOS 1.0	2024-09-04

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

UT02a is used for Conduction test, UT06a is used for Radiation test.

3.3. EUT set-ups

EUT set-up No.	Combination of EUT and AE	Remarks
Set.1	EUT1 + Battery + Adapter1 + Cable(type C to USB)	Wi-Fi function only

3.4. General Description

Equipment Under Test (EUT) is a model of 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	2021
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

5. Laboratory Environment

Conducted RF performance testing is performed in shielding room.

EMC performance testing is performed in Semi-anechoic chamber.

6. Test Results

6.1. Summary of Test Results

SUMMARY OF MEASUREMENT RESULTS	Sub-clause of Part15E	Sub-clause of IC	Verdict
Maximum Peak Output Power	15.407 (a)	/	P
Peak Power Spectral Density	15.407 (a)	/	P
6dB Emission Bandwidth	15.407 (e)	/	P
Radiated Unwanted Emission	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 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.

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	3.91V
Humidity	44%

7. Test Facilities 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	2025-08-12
2	Vector Signal Analyzer	FSW67	104051	Rohde & Schwarz	1 year	2025-04-01
3	Test Receiver	ESCI	100344	R&S	1 year	2025-04-01
4	LISN	ENV216	101200	R&S	1 year	2025-05-16
5	Attenuator	10dB/2W	/	Rosenberger	/	/
6	Shielding Room	S81	/	ETS-Lindgren	/	/

Radiated emission test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Period	Calibration Due date
1	Test Receiver	ESW44	103023	R&S	1 year	2025-06-06
2	EMI Antenna	VULB 9163	01222	SCHWARZBECK	1 year	2025-07-30
3	EMI Antenna	3115	00167250	ETS-Lindgren	1 year	2025-04-11
4	EMI Antenna	3116	2663	R&S	1 year	2025-02-21

Test Software

Test Item	Test Software and Version	Software Vendor
Radiated Continuous Emission	EMC32 V10.60.20	R&S
Conducted Emission	EMC32 V8.53.0	R&S

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. 6dB Emission 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

8.6. Radiated Unwanted Emission

Frequency Range	Uncertainty(dB)
30MHz ≤ f ≤ 1GHz	4.72
1GHz ≤ f ≤18GHz	4.84
18GHz ≤ f ≤40GHz	5.12

8.7. AC Power-line Conducted Emission

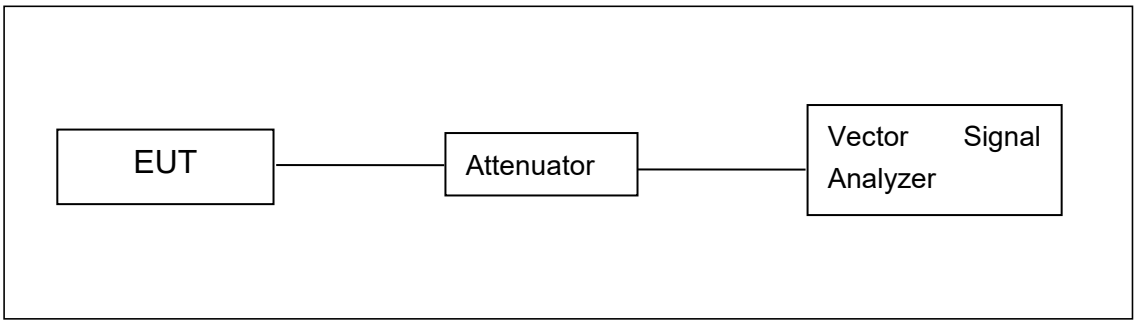
Measurement Uncertainty : 3.08dB,k=2

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

Measurement performed according to Clause 6.4, 6.5, 6.6 in ANSI C63.10-2013 and II.G.4, II.G.5, II.G.6 in KDB 789033.

The radiated emission test is performed in semi-anechoic chamber. The EUT was placed on a non-conductive table with 80cm above the ground plane for measurement below 1GHz and 1.5m above the ground plane for measurement above 1GHz. 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 from 0° to 360°and the measurement antenna is moved from 1m to 4m to get the maximization result. The maximization process was repeated with the EUT positioned in each of its three orthogonal orientations

A.2. Maximum Peak Output Power

Measurement Limit and Method:

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

Set span to encompass the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal.
Set RBW = 1 MHz.
Set VBW ≥ 3 MHz.
Number of points in sweep ≥ 2 × span / RBW.
Sweep time = auto.
Detector = power averaging (rms)
Trace average at least 100 traces in power averaging (rms) mode; however, the number of traces to be averaged shall be increased above 100 as needed to ensure that the average accurately represents the true average over the on and off periods of the transmitter.
Compute power by integrating the spectrum across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal using the instrument's band power measurement function with band limits set equal to the EBW (or occupied bandwidth) band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at 1 MHz intervals extending across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal. Add 10 log (1/x), where x is the duty cycle

A.2.1 Antenna Gain

Antenna gain is -1.36dBi and the value is supplied by the applicant or manufacturer.

A.2.2. Maximum Average Output Power-Conducted

EUT ID: UT02a

Measurement Results:

802.11a mode

Mode	Data Rate (Mbps)	Test Result (dBm)		
		5745MHz (Ch149)	5785MHz (Ch157)	5825MHz (Ch165)
802.11a	6	14.67	14.96	14.94

The data rate 6Mbps is selected as worst 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	14.15	14.40	14.27

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

802.11ac-VHT20 mode

Mode	Data Rate (Index)	Test Result (dBm)		
		5745MHz (Ch149)	5785MHz (Ch157)	5825MHz (Ch165)
802.11ac (20MHz)	MCS0	14.60	14.37	14.30

The data rate MCS0 is selected as worst 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	14.34	14.41

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

802.11ac-VHT40 mode

Mode	Data Rate (Index)	Test Result (dBm)	
		5755MHz (Ch151)	5795MHz (Ch159)
802.11ac (40MHz)	MCS0	14.14	13.92

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

802.11ac-VHT80 mode

Mode	Data Rate (Index)	Test Result (dBm)
		5775MHz (Ch155)
802.11ac (80MHz)	MCS0	12.82

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

The duty cycle of all mode are 100%

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Maximum output Power：11a CH157

Conclusion: PASS

A.3. Peak Power Spectral Density

Measurement Limit:

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

Set span to encompass the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal.
Set RBW = 500 kHz.
Set VBW ≥ 3 MHz.
Number of points in sweep ≥ 2 × span / RBW.
Sweep time = auto.
Detector = power averaging (rms)
Trace average at least 100 traces in power averaging (rms) mode; however, the number of traces to be averaged shall be increased above 100 as needed to ensure that the average accurately represents the true average over the on and off periods of the transmitter. Use the peak search function on the instrument to find the peak of the spectrum and record its value. Add 10 log (1/x), where x is the duty cycle.

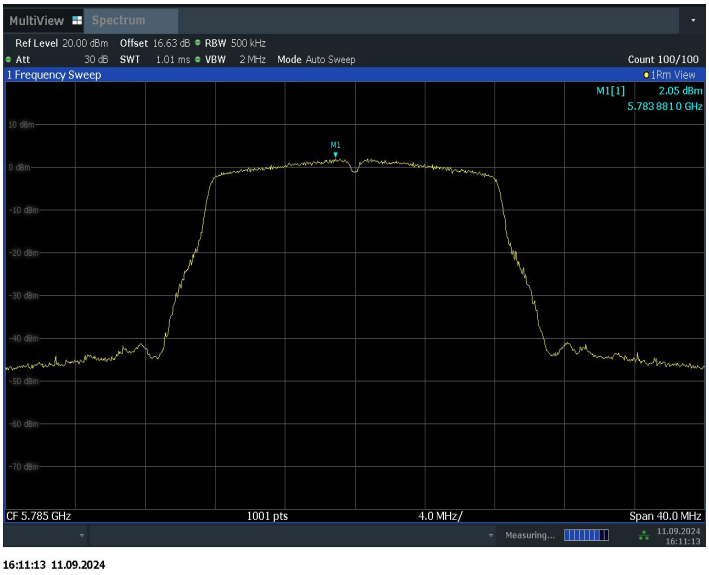
Measurement Uncertainty:

Measurement Uncertainty	0.75dB

EUT ID: UT02a

Measurement Results:

TestMode	Frequency[MHz]	Result [dBm/MHz]	Limit[dBm/MHz]	Verdict
11A	5745	2.01	≤30.00	PASS
	5785	2.05	≤30.00	PASS
	5825	2.00	≤30.00	PASS
11N40SISO	5755	-1.61	≤30.00	PASS
	5795	-1.74	≤30.00	PASS
11AC20SISO	5745	1.48	≤30.00	PASS
	5785	1.00	≤30.00	PASS
	5825	1.26	≤30.00	PASS
11AC80SISO	5775	-6.66	≤30.00	PASS



Peak Power Spectral Density:11a CH157

Conclusion: PASS

A.4. 6dB Emission Bandwidth

Measurement Limit:

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

Set RBW = 100 kHz.

Set the video bandwidth (VBW) ≥ 3 × RBW.

Detector = Peak.

Trace mode = max hold.

Sweep = auto couple.

Allow the trace to stabilize.

Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

Measurement Uncertainty:

Measurement Uncertainty	60.80Hz

EUT ID: UT02a

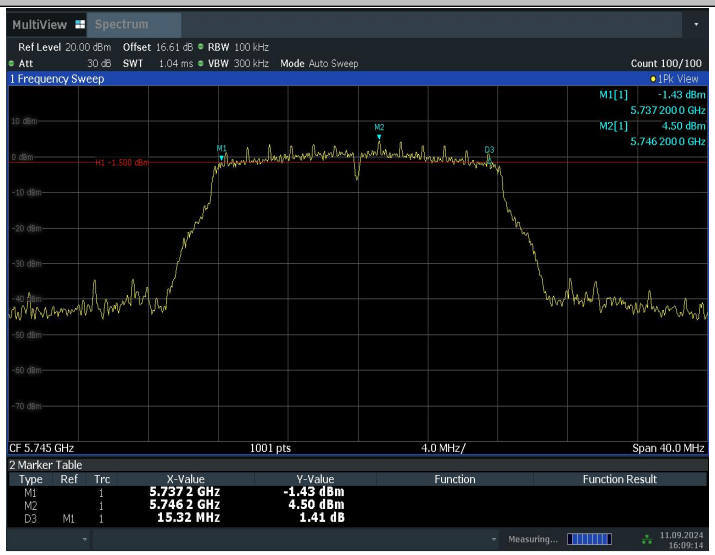
Measurement Result:

TestMode	Frequency[MHz]	6db EBW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A	5745	15.32	5737.20	5752.52	0.5	PASS
	5785	15.32	5777.40	5792.72	0.5	PASS
	5825	15.04	5817.40	5832.44	0.5	PASS
11N40SISO	5755	35.12	5737.40	5772.52	0.5	PASS
	5795	35.12	5777.40	5812.52	0.5	PASS

11AC20SISO	5745	15.12	5737.40	5752.52	0.5	PASS
	5785	15.12	5777.40	5792.52	0.5	PASS
	5825	15.12	5817.40	5832.52	0.5	PASS
11AC80SISO	5775	75.04	5737.40	5812.44	0.5	PASS

Test graphs as below:

11A_5745



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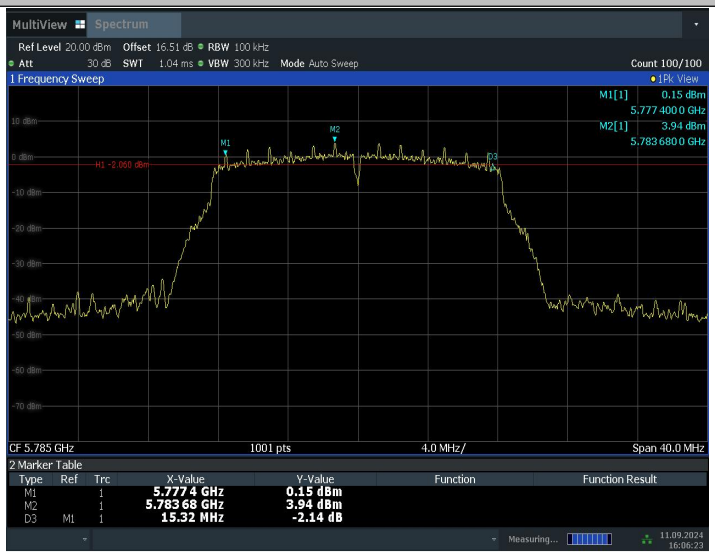

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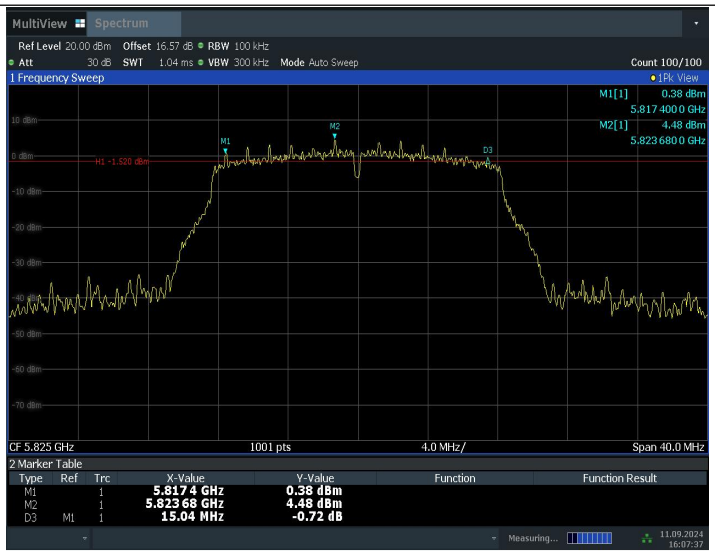
11A_5825



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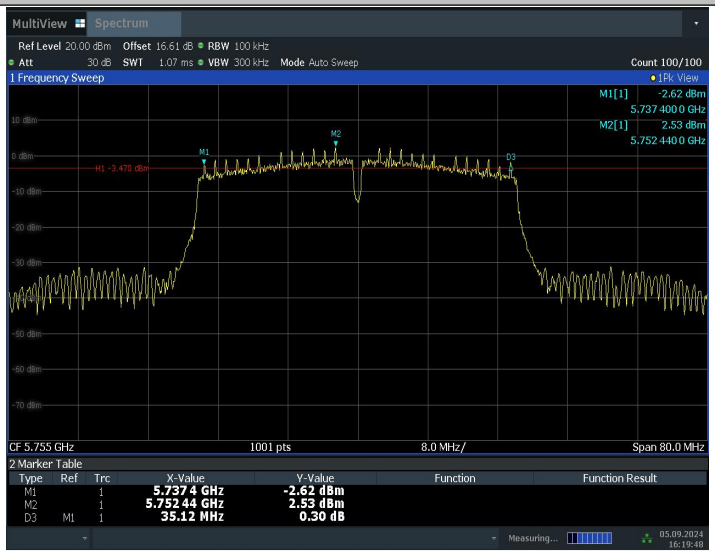
11N40SISO_5755



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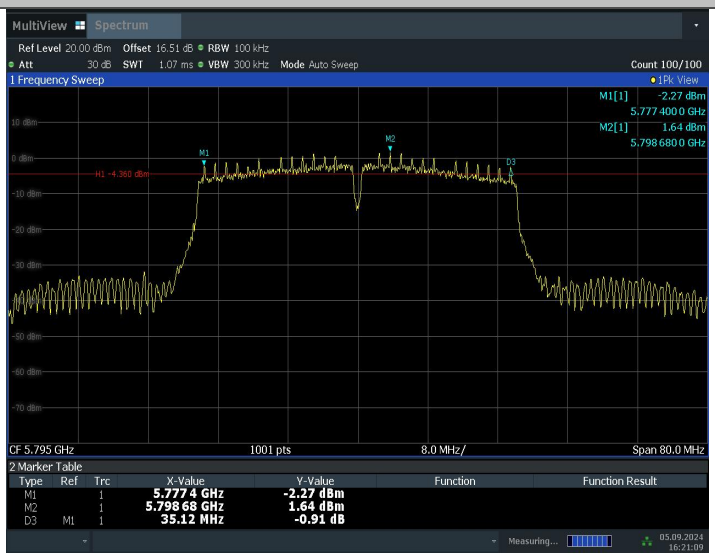
11N40SISO_5795



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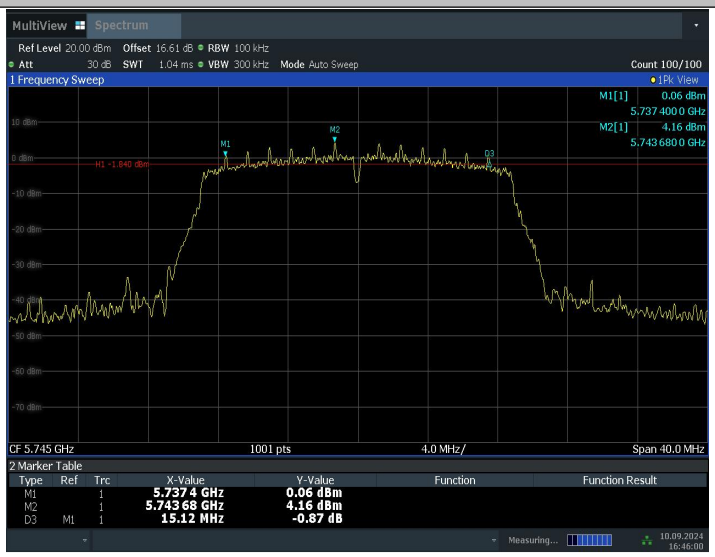 16:46:01 10.09.2024
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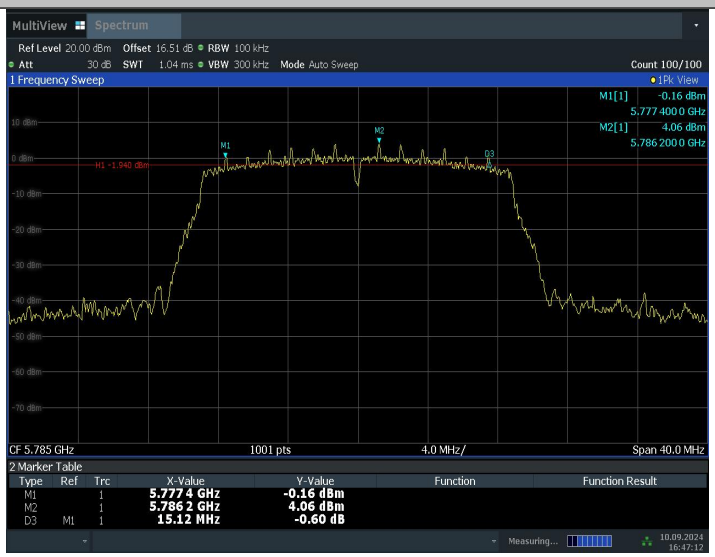
 16:47:13 10.09.2024
11AC20SISO_5825

16:48:34 10.09.2024

11AC80SISO_5775

16:29:28 05.09.2024

Conclusion: PASS

A.5. Radiated Unwanted Emission

A.5.1 Limits

Unwanted Emissions in the unrestricted bands shall not exceed the limits that shown in 15.407:

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.	

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 (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

Note: When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor (as defined in KDB 789033 II.G.2.d).

A.5.2 Test setup

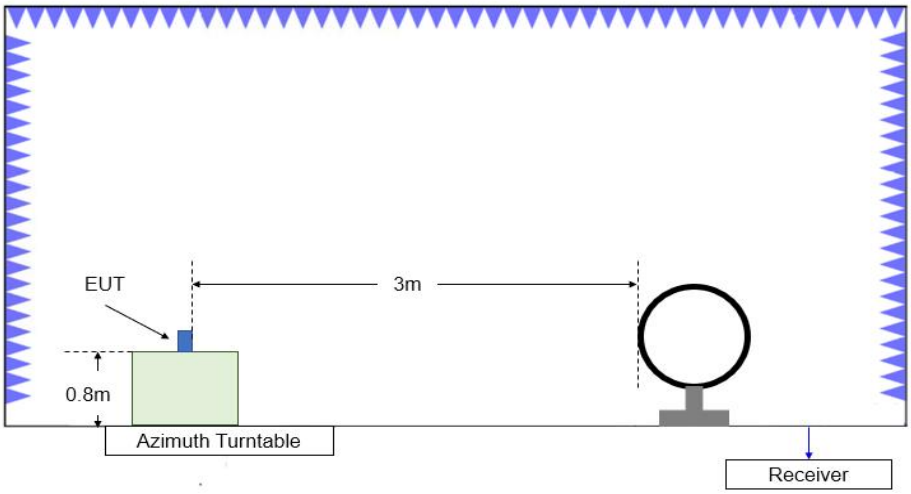


Figure A.5.1. Test Site Diagram (9kHz-30MHz)

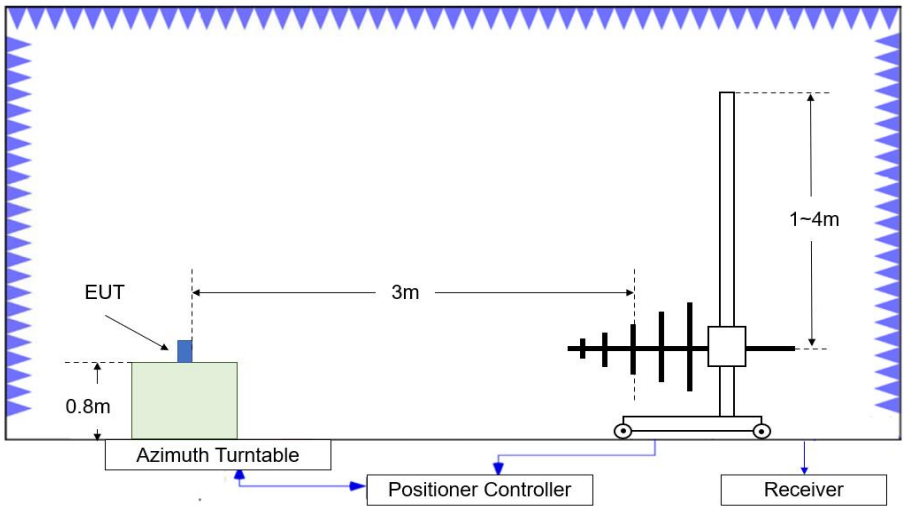


Figure A.5.2. Test Site Diagram (30MHz-1GHz)

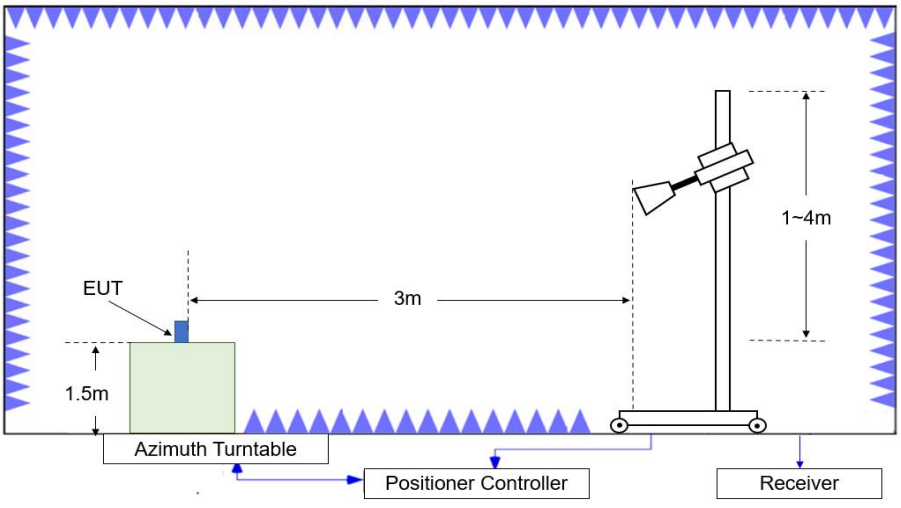


Figure A.5.3. Test Site Diagram (1GHz-40GHz)

A.5.3 Test Procedures

Radiated unwanted emissions from the EUT were measured according to ANSI C63.10and KDB 789033 D02 v02r01.

Test setting

Frequency of emission (MHz)	RBW/VBW
30-1000	100kHz/300kHz
1000-4000	1MHz/3MHz
4000-18000	1MHz/3MHz
18000-26500	1MHz/3MHz
26500-40000	1MHz/3MHz

A.5.4 Calculation

1. The measurement results reported below is calculated by:

Measurement Results (dBμV/m) = $P_{measurement}$ (dBμV) + Cable Loss(dB) + Antenna Factor (dB/m)

Where: $P_{measurement}$ is the field strength recorded from the instrument

2. Convert the resultant EIRP level to an equivalent electric field strength using the following relationship:

E=EIRP- 20log (*D)* +104.77

Where:

E is the field strength in dBμV/m

D is the measurement distance in meters

EIRP is the equivalent isotropically radiated power in dBm

Test note

1. The EUT is operating at its maximum duty cycle and its maximum power control level.
2. Investigation has been done on all modes and modulations/data rates. Only the radiated emissions of the configuration that produced the worst case emissions are reported in this section.
3. Spurious emissions for all channels were investigated and almost the same below 1GHz. According to FCC 47 CFR §15.31, emission levels are not report much lower than the limit by over 20dB
4. The test is carried out on both vertical and horizontal polarization and only maximization result of both polarizations is kept.
5. EUT in each of three orthogonal axis emissions had been tested out only the worst case (axis data) recorded in the report.
6. Measurement frequencies were performed from 9 kHz to the 10^{th} harmonic of highest fundamental frequency or 40GHz, whichever is lower.
7. No spurious emissions were detected within 20dBof the limit below 30MHz. OFS and semi-chamber comparison testing had been performed and the result came out very similar. (KDB 414788)

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.

Conclusion: PASS

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)
17896.600	45.07	-26.18	45.95	25.30	54.00	8.93	V
17919.150	44.97	-26.18	45.95	25.20	54.00	9.03	H
14492.100	38.91	-28.77	41.90	25.78	54.00	15.09	H
14477.800	38.67	-28.77	41.90	25.54	54.00	15.33	H
11759.700	36.63	-31.80	39.20	29.23	54.00	17.37	H
11818.000	36.56	-31.76	39.20	29.12	54.00	17.44	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)
17910.900	45.25	-26.18	45.95	25.48	54.00	8.75	H
17923.000	44.85	-26.18	45.95	25.08	54.00	9.15	V
14481.650	38.88	-28.77	41.90	25.75	54.00	15.12	H
14472.850	38.76	-28.77	41.90	25.63	54.00	15.24	H
11860.900	36.69	-31.54	39.15	29.08	54.00	17.31	V
11760.800	36.65	-31.80	39.20	29.25	54.00	17.35	H

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)
17924.100	44.92	-26.18	45.95	25.15	54.00	9.08	V
17917.500	44.79	-26.18	45.95	25.02	54.00	9.21	H
14484.400	38.62	-28.77	41.90	25.49	54.00	15.38	V
14473.400	38.61	-28.77	41.90	25.48	54.00	15.39	V
11875.750	37.15	-31.54	39.15	29.54	54.00	16.85	V
11775.650	36.69	-31.80	39.20	29.29	54.00	17.31	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)
17920.250	45.10	-26.18	45.95	25.33	54.00	8.90	H
17916.950	44.88	-26.18	45.95	25.11	54.00	9.12	H
14484.950	38.61	-28.77	41.90	25.48	54.00	15.39	H
14486.600	38.60	-28.77	41.90	25.47	54.00	15.40	H
11893.350	36.90	-31.25	39.10	29.05	54.00	17.10	V
11853.750	36.75	-31.54	39.15	29.14	54.00	17.25	H

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)
17914.750	44.79	-26.18	45.95	25.02	54.00	9.21	V
17929.600	44.79	-26.18	45.95	25.02	54.00	9.21	H
14482.200	38.65	-28.77	41.90	25.52	54.00	15.35	V
14489.350	38.65	-28.77	41.90	25.52	54.00	15.35	H
11777.300	36.69	-31.80	39.20	29.29	54.00	17.31	V
11942.850	36.67	-31.05	39.05	28.67	54.00	17.33	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)
17908.150	44.83	-26.18	45.95	25.06	54.00	9.17	H
17903.200	44.74	-26.18	45.95	24.97	54.00	9.26	H
14474.500	38.59	-28.77	41.90	25.46	54.00	15.41	H
14479.450	38.58	-28.77	41.90	25.45	54.00	15.42	V
11903.250	36.89	-31.25	39.10	29.04	54.00	17.11	V
11846.600	36.68	-31.54	39.15	29.07	54.00	17.32	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)
17924.650	44.75	-26.18	45.95	24.98	54.00	9.25	H
17914.750	44.66	-26.18	45.95	24.89	54.00	9.34	V
14497.050	38.72	-28.77	41.90	25.59	54.00	15.28	H
14492.100	38.63	-28.77	41.90	25.50	54.00	15.37	V
11860.350	36.83	-31.54	39.15	29.22	54.00	17.17	H
11837.250	36.59	-31.54	39.15	28.98	54.00	17.41	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)
17910.900	44.83	-26.18	45.95	25.06	54.00	9.17	H
17912.550	44.72	-26.18	45.95	24.95	54.00	9.28	H
13278.250	38.65	-30.02	40.60	28.07	54.00	15.35	V
14497.050	38.52	-28.77	41.90	25.39	54.00	15.48	V
11847.700	36.65	-31.54	39.15	29.04	54.00	17.35	V
11859.800	36.62	-31.54	39.15	29.01	54.00	17.38	H

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)
17930.700	45.01	-26.18	45.95	25.24	54.00	8.99	H
17903.200	44.84	-26.18	45.95	25.07	54.00	9.16	V
14493.750	38.90	-28.77	41.90	25.77	54.00	15.10	H
14487.150	38.68	-28.77	41.90	25.55	54.00	15.32	H
11821.850	36.90	-31.76	39.20	29.46	54.00	17.10	V
11858.700	36.79	-31.54	39.15	29.18	54.00	17.21	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)
17908.700	45.26	-26.18	45.95	25.49	54.00	8.74	H
17905.400	45.17	-26.18	45.95	25.40	54.00	8.83	H
14481.100	38.85	-28.77	41.90	25.72	54.00	15.15	V
14492.100	38.54	-28.77	41.90	25.41	54.00	15.46	H
11847.700	36.84	-31.54	39.15	29.23	54.00	17.16	V
11851.550	36.63	-31.54	39.15	29.02	54.00	17.37	V

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)
17926.300	45.13	-26.18	45.95	25.36	54.00	8.87	V
17904.300	45.11	-26.18	45.95	25.34	54.00	8.89	V
13299.150	38.86	-30.02	40.60	28.28	54.00	15.14	H
14478.900	38.77	-28.77	41.90	25.64	54.00	15.23	V
11844.950	36.89	-31.54	39.15	29.28	54.00	17.11	H
11858.150	36.81	-31.54	39.15	29.20	54.00	17.19	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)
17923.000	56.20	-26.18	45.95	36.43	74.00	17.80	V
17920.800	55.98	-26.18	45.95	36.21	74.00	18.02	V
13700.100	51.20	-29.51	41.00	39.71	68.20	17.00	V
14154.950	51.05	-28.86	41.70	38.21	68.20	17.15	H
11819.650	48.18	-31.76	39.20	40.74	74.00	25.82	V
11886.200	48.18	-31.25	39.10	40.33	74.00	25.82	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)
17890.550	56.46	-26.18	45.95	36.69	74.00	17.54	V
17877.350	56.27	-26.18	45.95	36.50	74.00	17.73	V
13578.000	51.05	-29.86	40.80	40.11	68.20	17.15	V
13708.900	51.03	-29.51	41.00	39.54	68.20	17.17	H
11408.250	47.94	-32.13	39.00	41.07	74.00	26.06	H
11805.900	47.72	-31.76	39.20	40.28	74.00	26.28	H

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)
17866.900	55.92	-26.18	45.95	36.15	74.00	18.08	V
17922.450	55.86	-26.18	45.95	36.09	74.00	18.14	V
13706.700	52.08	-29.51	41.00	40.59	68.20	16.12	H
13731.450	51.55	-29.40	41.10	39.85	68.20	16.65	H
11804.250	47.80	-31.76	39.20	40.36	74.00	26.20	H
11719.550	47.72	-31.84	39.20	40.36	74.00	26.28	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)
17905.400	56.79	-26.18	45.95	37.02	74.00	17.21	V
17921.900	55.75	-26.18	45.95	35.98	74.00	18.25	V
14396.950	51.23	-28.83	41.90	38.16	68.20	16.97	V
14121.950	51.14	-28.86	41.70	38.30	68.20	17.06	V
11933.500	47.86	-31.05	39.05	39.86	74.00	26.14	H
10603.050	47.83	-32.86	38.30	42.39	74.00	26.17	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)
17899.900	55.46	-26.18	45.95	35.69	74.00	18.54	H
17925.750	55.44	-26.18	45.95	35.67	74.00	18.56	V
13722.650	51.95	-29.40	41.10	40.25	68.20	16.25	V
13683.050	51.23	-29.51	41.00	39.74	68.20	16.97	H
11777.850	48.06	-31.80	39.20	40.66	74.00	25.94	H
11782.800	47.87	-31.76	39.20	40.43	74.00	26.13	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)
17910.900	56.05	-26.18	45.95	36.28	74.00	17.95	V
17914.200	55.88	-26.18	45.95	36.11	74.00	18.12	V
13774.350	51.69	-29.37	41.20	39.86	68.20	16.51	V
13798.000	51.30	-29.37	41.20	39.47	68.20	16.90	V
11841.100	48.22	-31.54	39.15	40.61	74.00	25.78	H
11840.550	47.99	-31.54	39.15	40.38	74.00	26.01	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)
17942.250	56.33	-26.18	45.95	36.56	74.00	17.67	V
17947.200	55.99	-26.18	45.95	36.22	74.00	18.01	V
13705.600	51.66	-29.51	41.00	40.17	68.20	16.54	V
13810.100	51.57	-29.37	41.20	39.74	68.20	16.63	H
11952.750	47.93	-31.05	39.05	39.93	74.00	26.07	V
11838.900	47.58	-31.54	39.15	39.97	74.00	26.42	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)
17418.650	55.81	-27.37	43.80	39.38	68.20	12.39	V
17947.200	55.61	-26.18	45.95	35.84	74.00	18.39	V
13736.950	51.58	-29.40	41.10	39.88	68.20	16.62	H
14205.000	51.44	-28.90	41.70	38.64	68.20	16.76	H
11861.450	48.18	-31.54	39.15	40.57	74.00	25.82	V
11871.900	48.16	-31.54	39.15	40.55	74.00	25.84	H

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)
17864.150	55.82	-26.18	45.95	36.05	74.00	18.18	H
17906.500	55.79	-26.18	45.95	36.02	74.00	18.21	V
14196.200	51.67	-28.90	41.70	38.87	68.20	16.53	V
13656.100	51.33	-29.68	40.90	40.11	68.20	16.87	V
11877.400	48.14	-31.54	39.15	40.53	74.00	25.86	H
11809.750	47.97	-31.76	39.20	40.53	74.00	26.03	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)
17912.000	55.87	-26.18	45.95	36.10	74.00	18.13	H
17947.750	55.73	-26.18	45.95	35.96	74.00	18.27	V
14098.300	52.07	-28.90	41.70	39.27	68.20	16.13	V
14175.850	51.30	-28.90	41.70	38.50	68.20	16.90	H
11277.900	48.14	-32.11	38.65	41.60	74.00	25.86	H
11870.250	47.81	-31.54	39.15	40.20	74.00	26.19	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)
17906.500	56.26	-26.18	45.95	36.49	74.00	17.74	H
17925.750	56.02	-26.18	45.95	36.25	74.00	17.98	H
14082.900	51.92	-28.90	41.70	39.12	68.20	16.28	V
14172.000	51.89	-28.90	41.70	39.09	68.20	16.31	V
11778.950	47.94	-31.80	39.20	40.54	74.00	26.06	H
11433.000	47.90	-32.13	39.00	41.03	74.00	26.10	H

Band edge compliance

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
802.11n HT40	5755 MHz	Fig.5	P
	5795 MHz	Fig.6	P
802.11ac HT20	5745 MHz	Fig.7	P
	5825 MHz	Fig.8	P
802.11ac HT40	5755 MHz	Fig.9	P
	5795 MHz	Fig.10	P
802.11ac HT80	5775 MHz	Fig.11 Fig.12	P

Conclusion: PASS

Test graphs as below:

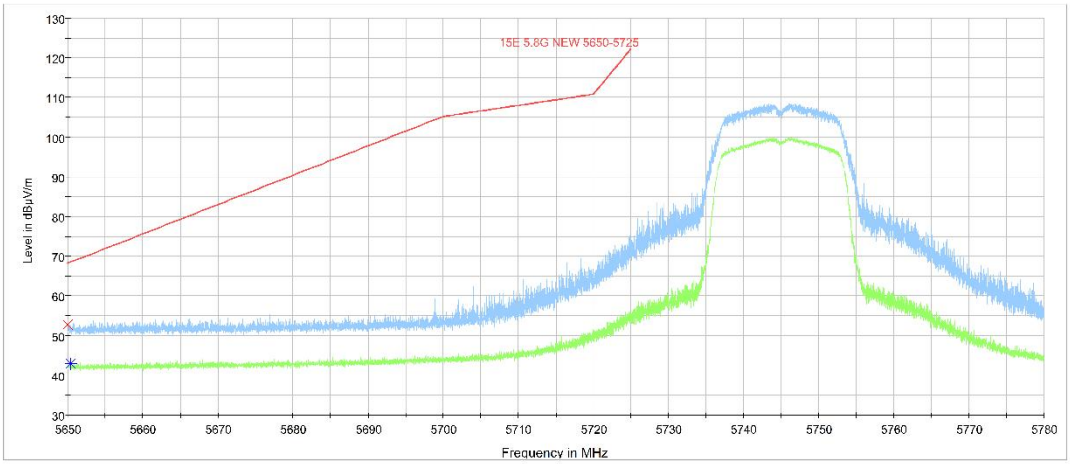


Fig. 1 Band Edges (802.11a Ch149,5745MHz)

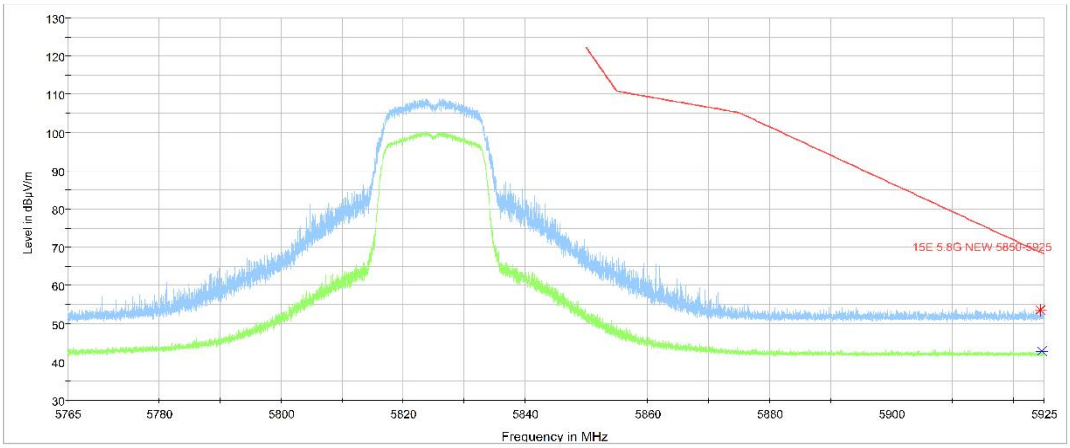


Fig. 2 Band Edges (802.11a Ch165, 5825MHz)

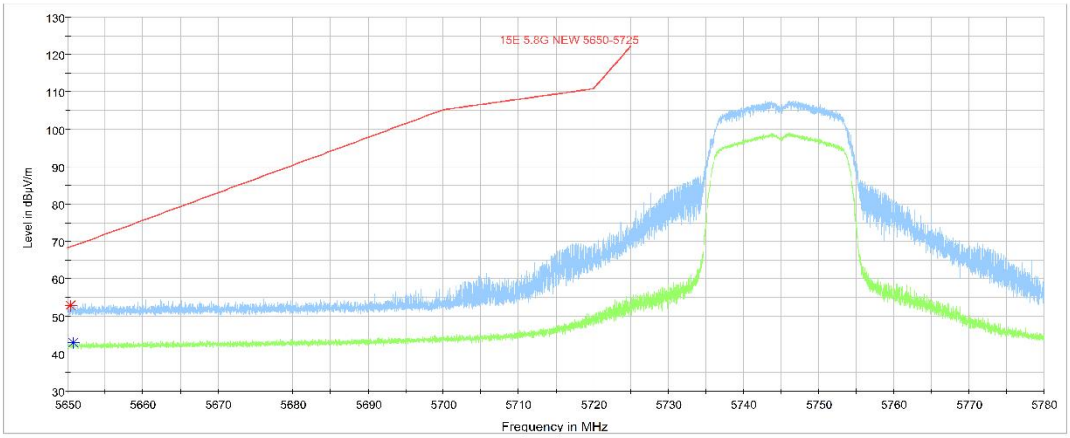


Fig. 3 Band Edges (802.11n-HT20 Ch149, 5745MHz)

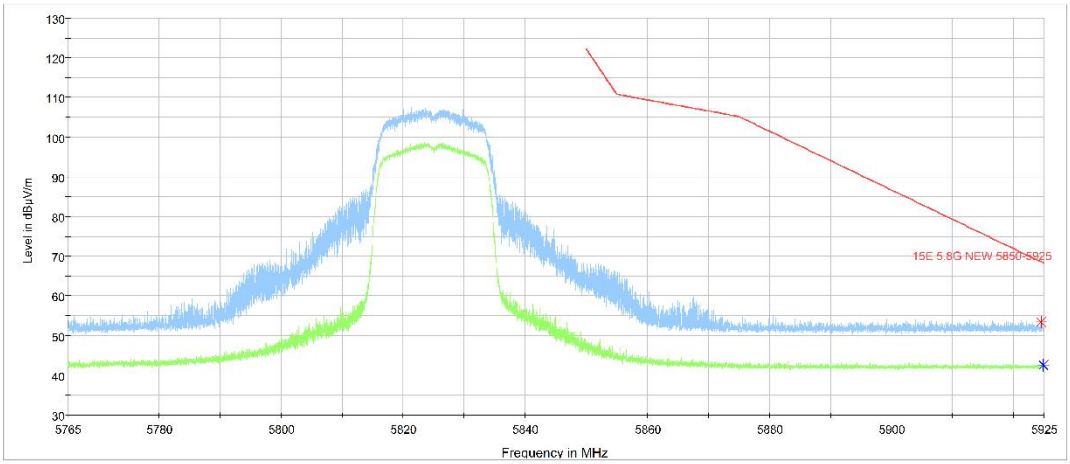


Fig. 4 Band Edges (802.11n-HT20 Ch165, 5825MHz)

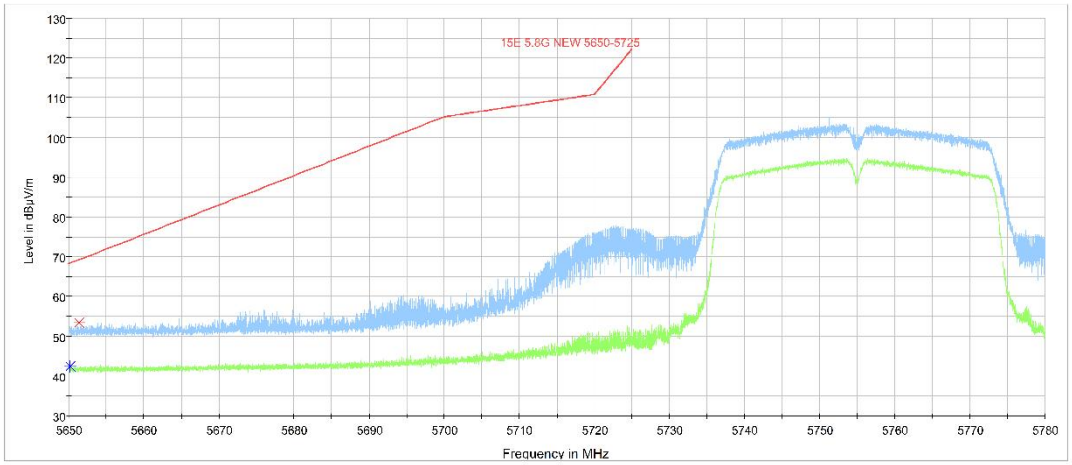


Fig. 5 Band Edges (802.11n-HT40 Ch151, 5755MHz)

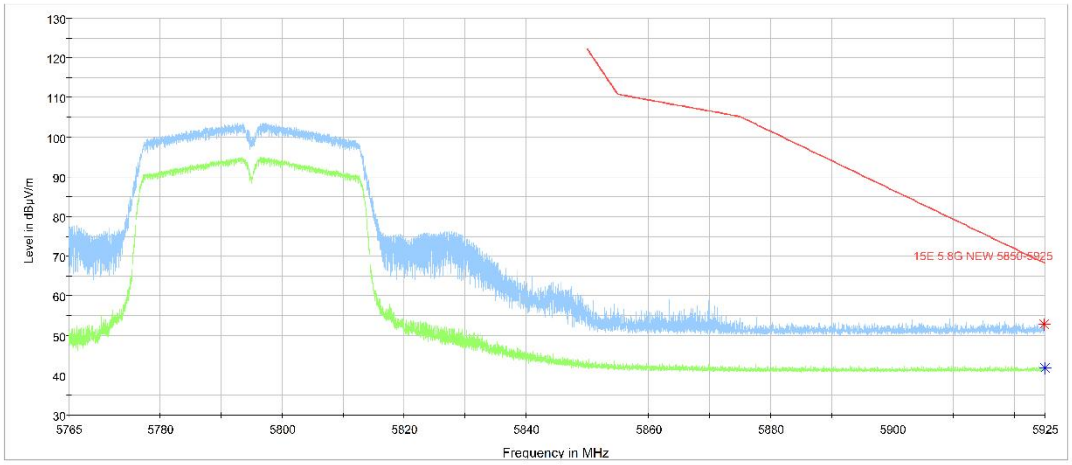


Fig. 6 Band Edges (802.11n-HT40 Ch159, 5795MHz)

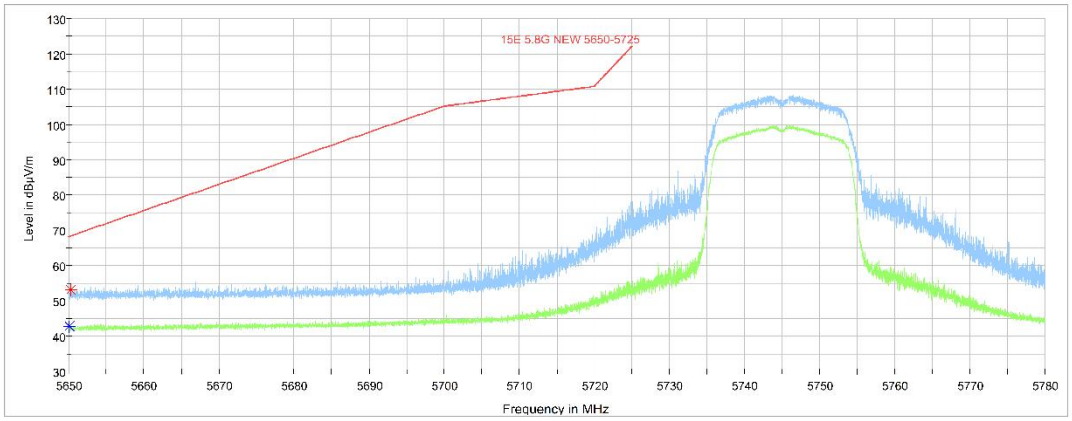


Fig. 7 Band Edges (802.11ac-HT20 Ch149, 5745MHz)

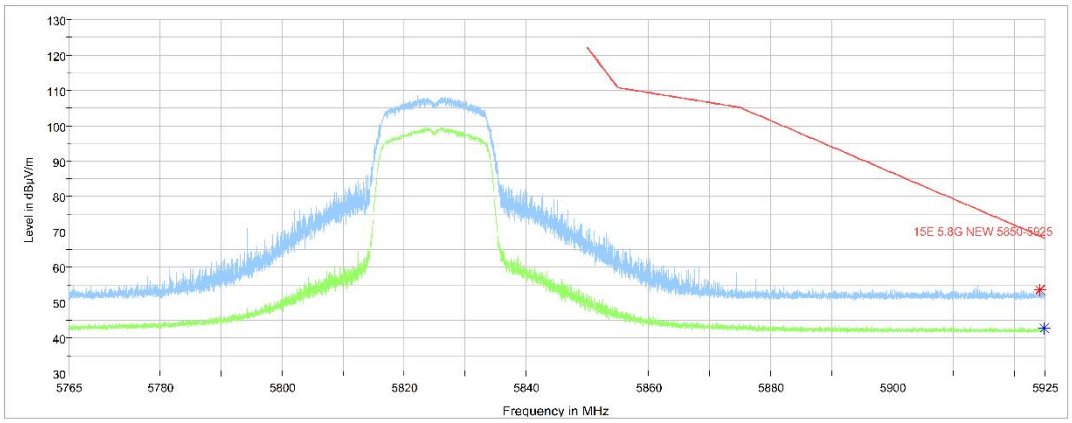


Fig. 8 Band Edges (802.11ac-HT20 Ch165, 5825MHz)

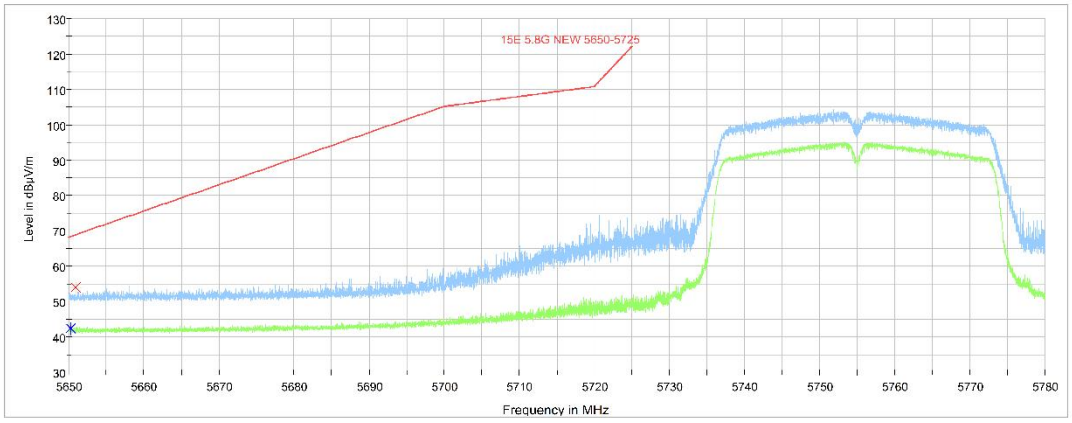


Fig. 9 Band Edges (802.11ac-HT40 Ch151, 5755MHz)

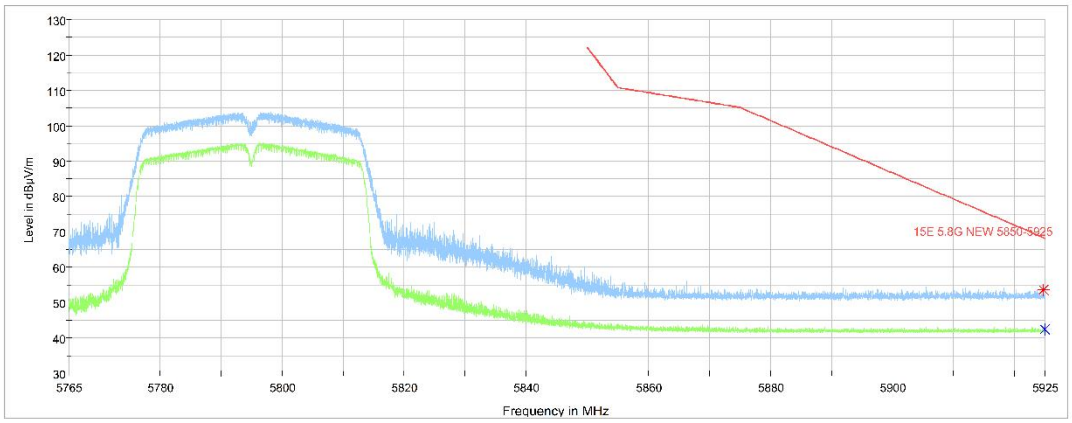


Fig. 10 Band Edges (802.11ac-HT40 Ch159, 5795MHz)

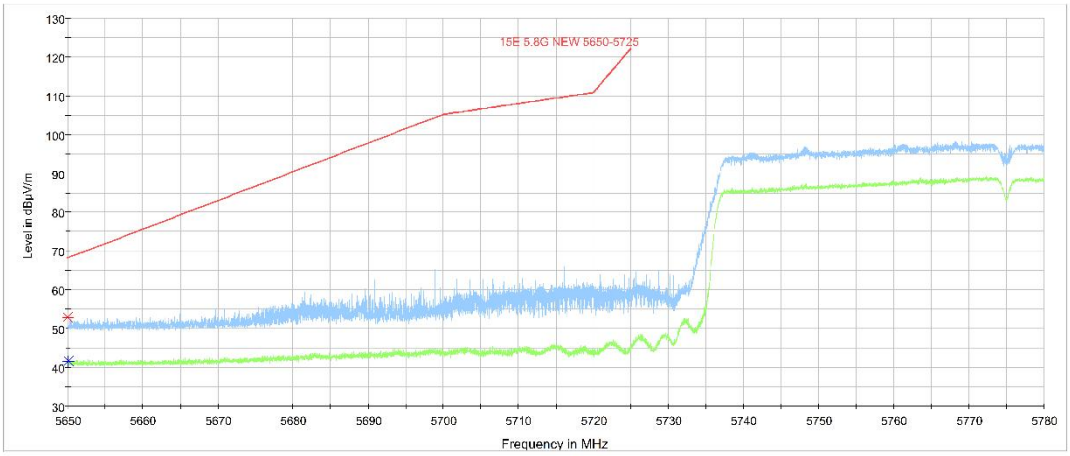


Fig. 11 Band Edges (802.11ac-HT80 Ch155, 5775MHz)

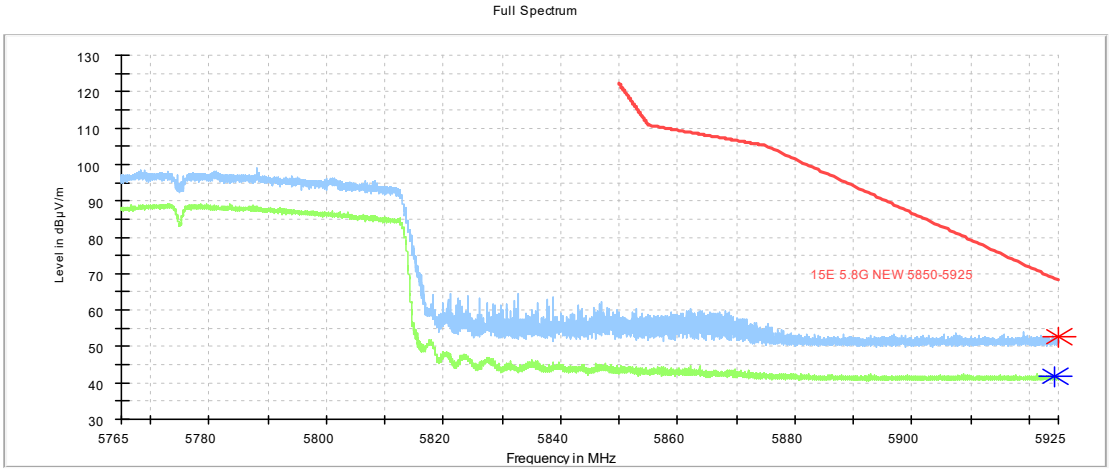


Fig. 12 Band Edges (802.11ac-HT80, 5775MHz)

A.6. AC Powerline Conducted Emission

A.6.1 Summary

All AC line conducted spurious emissions are measured with a receiver connected to a grounded LISN while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates and modes were investigated for conducted spurious emissions. Only the conducted emissions of the configuration that produced the worst case emissions are reported in this section

A.6.2 Method of Measurement

See Clause 6.2 of ANSI C63.10 specifically.

See Clause 4 and Clause 5 of ANSI C63.10 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.

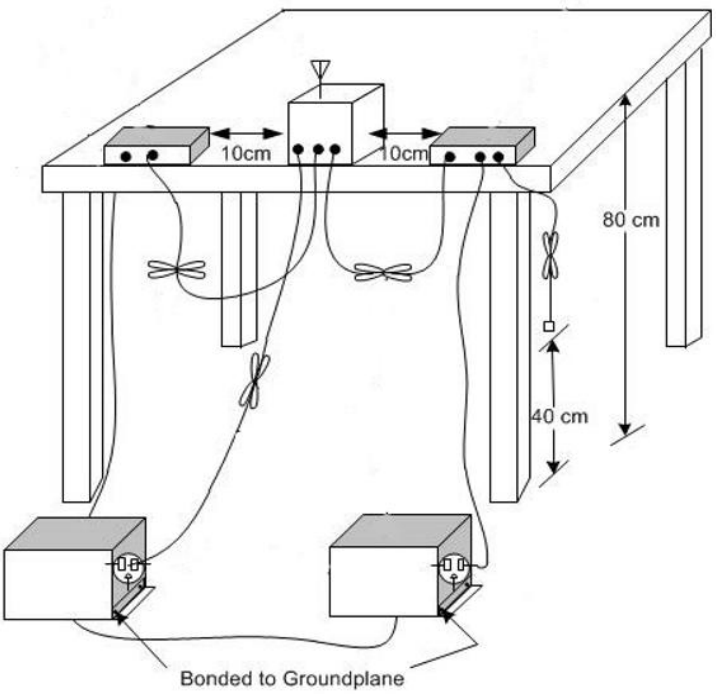
The measurement bandwidth is:

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

A.6.3 Test Condition

Voltage（V）	Frequency（Hz）
120	60

A.6.4 Test setup



A.6.5 Measurement Result and limit

Wi-Fi (Quasi-peak Limit)

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Result (dBμV)		Conclusion
		With charger		
		Wi-Fi	Idle	
0.15 to 0.5	66 to 56	Fig.A.6.1	Fig. A.6.2	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.				

Wi-Fi (Average Limit)

Frequency range (MHz)	Average Limit (dBμV)	Result (dBμV)		Conclusion
		With charger		
		Wi-Fi	Idle	
0.15 to 0.5	56 to 46	Fig.A.6.1	Fig. A.6.2	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.				

Conclusion: Pass

Test graphs as below:

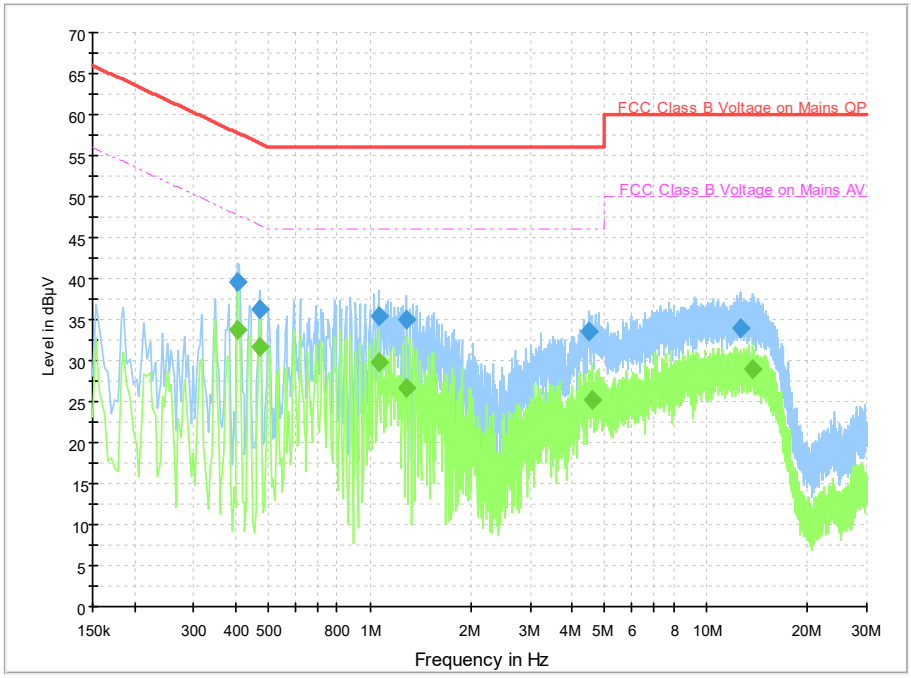


Fig.A.6.1. AC Powerline Conducted Emission-802.11a, CH149 TX

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.406000	39.6	2000.0	9.000	On	N	19.9	18.1	57.7	
0.470000	36.3	2000.0	9.000	On	L1	20.0	20.2	56.5	
1.062000	35.3	2000.0	9.000	On	L1	19.9	20.7	56.0	
1.282000	35.1	2000.0	9.000	On	L1	19.9	20.9	56.0	
4.490000	33.6	2000.0	9.000	On	N	19.6	22.4	56.0	
12.606000	33.9	2000.0	9.000	On	L1	20.0	26.1	60.0	

Final Result 2

Frequency (MHz)	CAverage (dBµV)	Meas. Time	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.406000	33.8	2000.0	9.000	On	N	19.9	13.9	47.7	
0.470000	31.7	2000.0	9.000	On	L1	20.0	14.9	46.5	
1.062000	29.7	2000.0	9.000	On	L1	19.9	16.3	46.0	
1.282000	26.7	2000.0	9.000	On	L1	19.9	19.3	46.0	
4.570000	25.2	2000.0	9.000	On	N	19.6	20.8	46.0	
13.802000	28.9	2000.0	9.000	On	L1	20.0	21.1	50.0	

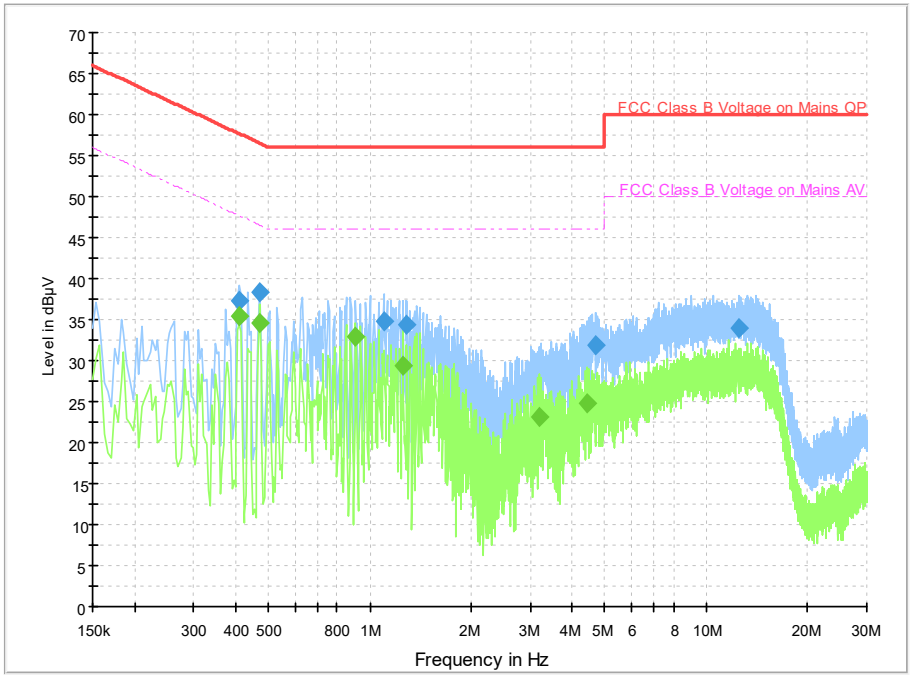


Fig.A.6.2. AC Powerline Conducted Emission-Idle

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.410000	37.2	2000.0	9.000	On	L1	20.0	20.5	57.6	
0.470000	38.3	2000.0	9.000	On	N	19.9	18.2	56.5	
1.098000	34.9	2000.0	9.000	On	L1	19.9	21.1	56.0	
1.282000	34.4	2000.0	9.000	On	N	19.7	21.6	56.0	
4.714000	31.9	2000.0	9.000	On	N	19.6	24.1	56.0	
12.446000	34.0	2000.0	9.000	On	L1	20.0	26.0	60.0	

Final Result 2

Frequency (MHz)	CAverage (dBµV)	Meas. Time	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.410000	35.5	2000.0	9.000	On	N	19.9	12.2	47.6	
0.470000	34.6	2000.0	9.000	On	N	19.9	11.9	46.5	
0.910000	32.9	2000.0	9.000	On	N	19.7	13.1	46.0	
1.254000	29.4	2000.0	9.000	On	N	19.7	16.6	46.0	
3.202000	23.1	2000.0	9.000	On	L1	19.8	22.9	46.0	
4.426000	24.8	2000.0	9.000	On	N	19.6	21.2	46.0	

A.7. Antenna Requirement

The antenna of the device is permanently attached. There are no provisions for connection to an external antenna.

The unit complies with the requirement of FCC Part 15.203.

ANNEX B: EUT parameters

Disclaimer: The antenna gain and worse case 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

Accredited Laboratory

A2LA has accredited

TELECOMMUNICATION TECHNOLOGY LABS, CAICT

Beijing, People's Republic of China

for technical competence in the field of

Electrical Testing

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 *General requirements for the competence of testing and calibration laboratories*. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (*refer to joint ISO-ILAC-IAF Communiqué dated April 2017*).

Presented this 23rd day of July 2024.

Mr. Trace McInturff, Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 7049.01
Valid to July 31, 2026

For the tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation.

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